Publications Committee

University of Texas Bulletin

No. 1754: September 25, 1917

A KEY TO THE FAMILIES AND GENERA OF THE WILD PLANTS OF AUSTIN, TEXAS

By

MARY S. YOUNG

Published by the University six times a month and entered as second-class matter at the postoffice at AUSTIN, TEXAS

Publications of the University of Texas

The University publishes bulletins six times a month, so numbered that the first two digits of the number show the year of issue, the last two the position in the yearly series. (For example, No. 1701 is the first bulletin of the year 1917.) These comprise the official publications of the University, publications on humanistic and scientific subjects, bulletins prepared by the Department of Extension and by the Bureau of Municipal Research and Reference, and other bulletins of general educational interest. With the exception of special numbers, any bulletin will be sent to a citizen of Texas free on request. All communications about University publications should be addressed to the Chairman of the Publications Committee, University of Texas, Austin.

B192-118-750-6644

University of Texas Bulletin

No. 1754: September 25, 1917

A KEY TO THE FAMILIES AND GENERA OF THE WILD PLANTS OF AUSTIN, TEXAS

By

MARY S. YOUNG

Published by the University six times a month and entered as second-class matter at the postoffice at AUSTIN, TEXAS

The benefits of education and of useful knowledge, generally diffused through a community, are essential to the preservation of a free government.

Sam Houston

Cultivated mind is the guardian genius of democracy. . . . It is the only dictator that freemen acknowledge and the only security that freemen desire.

Mirabeau B. Lamar

INTRODUCTION

The following key is designed for the use of beginners in botany and for others interested in the identification of the wild plants of Austin. It is based only on those species that have been found growing wild here, though one or two others are included, and for this reason its accuracy could not be guaranteed for any other region.

The object of the writer was to make the key easy to follow by using, whenever practicable, the more obvious characters, such as color, size, form of the leaves, etc., and by dispensing, as far as possible with technical descriptive terms. The work is not designed to take the place in any sense of the ordinary manual for the student of taxonomy, but merely to serve as an introduction to the subject of classification, and to equip the beginner with a preliminary acquaintance with a number of plants, that will help him in the use of larger works. It is a matter of common experience, that the more plants one knows, the easier it is to identify others that are unknown.

Although intended primarily for students of botany, no knowledge of the subject is necessary, aside from acquaintance with the parts of a flower, and a few types of flower cluster and leaf forms that are illustrated in the diagrams.

A sharp knife and a small magnifying glass are the only instruments needed, except in the case of a few members of some of the more difficult families, as the composites and carrot family, where some minute organs have to be examined under a microscope. The student should, if possible, have access to Small's Flora of the Southeastern States, for fuller descriptions than are given in the key, and for the determination of species, if that is desired. For the identification of the trees when not in bloom, Lewis' Trees of Texas should be used, as it contains a key based largely on leaf and stem characters.

In the construction of the keys free use has been made of those in Small's Flora and other manuals, and in the case of some of the larger families Small's keys to the genera were merely shortened and adapted to our uses. Many of the definitions in the list were taken from the glossary in Gray's New Manual of Botany, seventh edition.

How to Use the Key

Turn first to the Key to the Families, p. 14 and determine to which of the two large groups, Ferns and their Allies, or Seed Plants, your plant belongs. Let us suppose that it is our common pink primrose. This is, of course, a seed plant. Next decide between Class I and Class II. The seeds borne in a closed ovary, place the primrose in Class II. The four sepals, four petals, eight stamens, and the net-veined leaves are enough to assure us that it is a dicotyledon, Sub-class II, without any examination of the stem or seed structure.

Next, the presence of both calyx and corolla lead us to discard Division I under Dicotyledons, and Divisions II and III must be considered. As the petals are distinct, that is, not united with each other, Division II is chosen. One must now decide between A and B, and, as the stamens are not more than 8, or twice as many as the petals, A is discarded.

Under B the primrose is easily placed in II, as it is an herb. Under this division, as there is only one ovary, 1 is easily discarded, and we must decide between 2, 3, and 4. This is the most difficult point yet, as it will be necessary to make a thin cross section of the ovary. Usually it is a good plan to use a large, old ovary from which the flower has dropped. A good section will show four cavities, or cells, and we decide upon 4.

The primrose is a land plant, b, and the ovary is inferior, (2). The pistil has only one style, which means that the four styles belonging to the four carpels, as well as the carpels themselves, have united to form the compound pistil. This, with the flower on the numerical plan of four, leads us to Epilobiaceae 86, on the right hand side of the page. This is the botanical name of the family to which our plant belongs, and the number refers to the order in which it is listed.

We must turn now to the Key to the Genera and look for Family 86. This is found to be the Evening Primrose Family. The pink color of the flower easily places it under the first division. If a ripe fruit is available, it will be found to be dehiscent, that is, it opens to discharge its seeds. If, however, there are no ripe fruits, the large, regular flowers are sufficient to lead us to number (1), which is seen in the list below to be Hartmannia, Pink Primrose.

Definitions and Explanation of Terms

Achene. A small dry indehiscent fruit containing a single seed. Fig. 7.

Aggregated fruit. The fruits of an entire flower cluster ripening in a mass which simulates a single fruit, as in the mulberry or pineapple.

Alternate leaves. Leaves attached singly at intervals along the stem.

Ament. A scaly spike, catkin, as in the willows, the staminate clusters of oak, walnut, etc.

Anther. The pollen-bearing part of the stamen. Fig. 1.

Awn. A stiff bristle-shaped appendage.

Axil of a leaf. The angle formed by a leaf and the stem.

Axillary flower clusters. Flower clusters in the axils of leaves.

Basal leaves. Leaves attached at the base of the stem.

Blade of a leaf. The expanded portion of the leaf.

Bract. A more or less modified leaf usually subtending a flower or flower cluster, usually smaller than the foliage leaves.

Bractlet. A secondary bract, on a flower stalk, or subtending the sepals.

Calyx. The outer circle of perianth parts of a flower, commonly green. All the sepals make up the calyx.

Capsule. A dry dehiscent fruit composed of two or more united carpels.

Carpel. A single simple pistil, or one of the components of a compound pistil. The carpel is supposed to represent a single megasporophyll of Gymnosperms and Pteridophytes. Figs. 3 and 4.

Cell of an ovary. One of the cavities of a compound ovary. Figs. 4 and 5.

Chaff. A thin dry and membranous scale or bract. In the composites, the bracts which subtend the disk flowers. Fig. 6.

Ciliate. Fringed with hairs on the margin.

Composites. Including Ambrosiaceae, Carduaceae, and Cichoreaceae; sometimes classed as a single family, Compositae.

Compound leaf. A leaf composed of two or more leaflets, as in a clover or mesquite leaf. Figs. 23, 25, and 26.

Compound ovary. One composed of two or more carpels. There are usually as many cavities as carpels in the compound ovary, but may be only one. Occasionally there are more by the formation of extra partitions. Figs. 4 and 5.

Connective. The sterile portion of the anther, which lies between the pollen sacs. Fig. 1.

Convolute. Used to describe a corolla in which the petals overlap in the bud in such a way as to leave one edge of each petal exterior. Fig. 21.

Corm. The enlarged fleshy base of a stem, differing from a bulb in being solid instead of scaly.

Corolla. The inner portion of the perianth, commonly colored or white, composed of the petals.

Cotyledon. The first leaves of a plant, which are present in the embryo in the seed. These may or may not function later as foliage leaves.

Creeping. Used of a prostrate plant in which the branches take root.

Dehiscent. Opening regularly. Used of a fruit which opens when mature to shed its seeds, and of anther which opens to allow the escape of the pollen.

Dioecious. Bearing staminate and pistillate flowers on two different plants.

Disk. In composites, part of the head exclusive of the rays. Fig. 6.

Dissected leaf. A leaf cut or divided into very many segments.

Distinct. Separate from each other, not united. Fig. 3.

Drupe. A stone fruit, as the cherry, or plum, with a nut-like inner portion enclosing the seed, and a fleshy outer portion.

Entire leaves. Leaves with margins neither toothed, lobed nor incised. Fig. 23.

Epiphyte. A plant which lodges on another, but derives none of its sustenance from it, as the lichens, ball moss, etc.

4-foliate, 3-foliate, etc. Composed of 4, 3, etc. leaflets. Fig. 25.

Filament. The stalk of a stamen, which bears the anther. Fig. 1.

Fertile stamen. One which produces pollen.

Head. A dense, more or less rounded cluster of short-stalked or sessile flowers. Fig. 6 shows one type of head.

Herbaceous. Used of bracts which are leaf-like in color and texture.

Incised. Deeply and sharply cut or notched.

Indehiscent. Not opening, used of a fruit which does not discharge its seeds.

Indusium (plural indusia). The membrane which covers the cluster of sporangia in the ferns.

Inferior ovary. One which has the other flower parts attached to its top. Fig. 2.

Imbricated. Used of a corolla the petals of which overlap in the bud in such a way as to leave one petal with both edges exterior, one with both edges interior, and the others with one edge exterior and one interior. Fig. 19.

Involucre. A set of bracts surrounding a flower cluster or a single flower. Fig. 6.

Irregular flower. A flower in which all the parts of one set, as all sepals or all petals, are not alike; not radially symmetrical, as the violet or pansy.

Legume. A one-celled, dry fruit formed of one carpel, usually splitting into two valves when mature, such as the bean or pea pod. The fruit of the Cassiaceae, Mimosaceae and Fabaceae.

Monoecious, bearing staminate and pistillate flowers on the same plant.

Nerve. A simple, unbranched vein or slender rib.

Opposite leaves. Leaves attached at points opposite each other on the stem.

Ovary. The portion of the pistil which contains the ovules. Figs. 1, 2, 4, 5.

Ovule. The undeveloped seed. The ovule corresponds to the megasporangium of Pteriodophytes. Figs. 1, 2, 4, 5.

Palmate. Used of a leaf which is radiately lobed or divided.

Palmately compound leaf. One in which the leaflets are radiately arranged. Fig. 25.

Papilionaceous. Used of the peculiarly irregular flowers of many of the leguminous plants, as the sweet pea and bean. The name refers to a fancied resemblance to a butterfly.

Pappus. The modified calyx of the composite flowers, consisting

of a circle of hairs, scales, bristles, or a crown, attached to the top of the achene. Fig. 7.

Perianth. The floral envelop, including both calyx and corolla, if both are present.

Petal. One of the parts of a flower which compose the corolla, commonly white or colored. Fig. 1.

Pinnate. Used of a compound leaf in which the leaflets are arranged along each side of a common axis. Fig. 23.

Pinnately compound, pinnate. Fig. 23.

Pistil. The ovule-bearing organ of the flower, composed of one or more carpels, and including ovary, stigma and style when present. Fig. 1.

Pistillate flower. One bearing pistil or pistils, but no stamens.

Pollen. The grains contained within the anthers of the stamen, which must be carried to the stigma to insure fertilization in the ovules. The pollen grains represent the microspores of Pteridophytes.

Pollen sacs. The sac-like portions of the anther which contain the pollen. Fig. 1.

Raceme. A flower cluster in which single flowers are attached by stalks at intervals along a more or less elongated axis. Fig. 15.

Rays. Used of the outer flowers of a head of one of the Carduaceae, with strap-shaped corollas. Fig. 6.

Receptacle. The more or less expanded tip of a stem which bears the flower parts, or, in the composites, the portion of the head to which the flowers are attached. Figs. 1, 6.

Regular flower. One in which all the parts of a whorl, as the sepals, are alike in size, form and arrangement; a radially symmetrical flower.

Sagittate. Shaped like an arrow-head, with the basal lobes extended downward and pointed. Fig. 11.

Sepal. One of the divisions of the calyx. Fig. 1.

Simple leaf, not compound. Fig. 22.

Sorus (plural sori). A group of sporangia in the ferns.

Spadix. A spike with a thick, fleshy axis.

Spathe. A large bract which encloses a flower-cluster.

Spike. A flower cluster, in which the flowers are attached without stalks along a more or less elongated axis. Fig. 14.

Spikelet, a small or secondary spike; applied to the flower clusters of grasses and sedges.

Sporangium. A receptacle which contains spores.

Stamen. The pollen-bearing organ of a flower. Fig. 1.

Staminate flower. A flower with stamens but no pistil

Stigma. The portion of the pistil upon which the pollen must lodge to insure fertilization. Fig. 1.

Stipules. Appendages which grow one on each side of the base of the leaf stalk of some leaves. They may be leaflike. Fig. 27.

Style. The portion of the pistil which connects the stigma with the ovary. Fig. 1.

Stylopodium. A disk-like expansion of the base of the style in Ammiaceae. Fig. 9.

Superior ovary. Used of an ovary when the other flower parts are attached to the receptacle at its base. Fig. 1.

2-compound. Applied to a compound leaf of which the leaflets are themselves compound. Fig. 26.

3-compound. Applied to a 2-compound leaf of which the secondary leaflets are compound.

Terminal flower cluster. A cluster which terminates a main axis or branch.

Tuber. A thickened short subterranean branch, as a potato.

Umbel. A flower cluster in which the flower stalks spring from the same point, often flat-topped. Fig. 12.

Valvate. Used of a calyx or corolla in which the sepals or petals meet in the bud without overlapping. Fig. 20.

Vascular bundle. One of the strands of wood fibers and vessels which make up the woody tissue of a stem. Figs. 17, 18.

Versatile anther. An anther with the filament attached at or near the middle, swinging freely on it. Fig. 10.

Whorl. A cluster of leaves or other organs which are arranged in a circle around the stem.

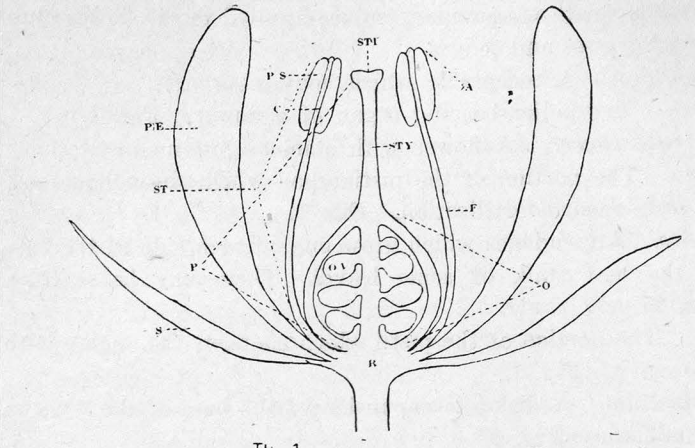

Fig 1

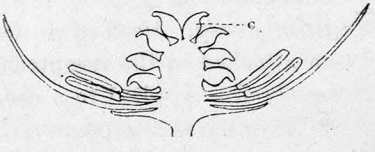

Fig 3

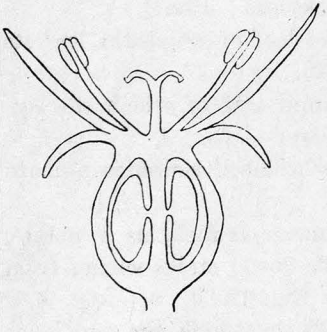

Fig 2.

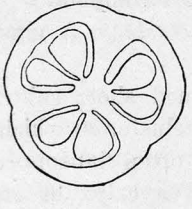

Fig 4.

Fig 5

EXPLANATION OF FIGURES

Fig. 1. Diagram of a flower with superior ovary. S, sepal. PE, petal. ST, stamen. P, pistil. F, filament. A, anther. PS, pollen sac. C, connective. O, ovary. OV, ovule. STY, style. STI, stigma. R, receptacle.

Fig. 2. Flower with inferior ovary.

Fig. 3. Flower with carpels distinct. C, carpel.

Fig. 4. Cross section of a 3-celled ovary of 3 carpels.

Fig. 5. Cross section of a 1-celled ovary of 2 carpels.

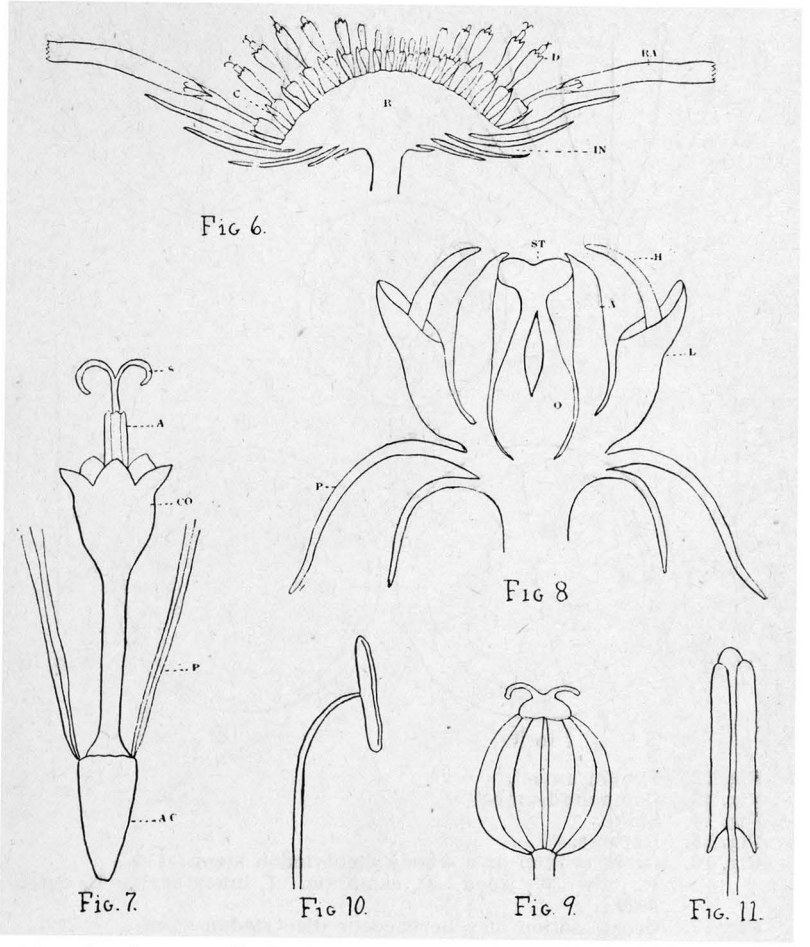

Fig. 6. A composite head.
RA, ray flower. D, disk flower. R, receptacle. IN, involucre. C, chaff.

Fig. 7. Single flower of composite.
S, stigma. A, anther. CO, corolla. P, pappus. AC, achene.

Fig. 8. Flower of milkweed, Asclepias.
S, sepal. P, petal. L, lobe of crown. H, horn. A, anther. O, ovary. ST, stigma.

Fig. 9. Fruit of one of the carrot family.
St, stylopodium.

Fig. 10. Stamen with versatile anther.

Fig. 11. Sagittate anther.

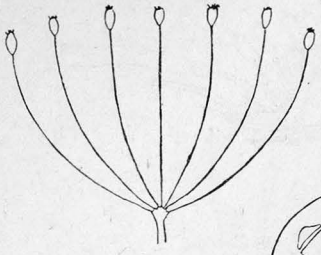

Fig. 12.

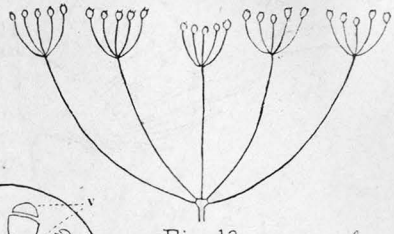

Fig. 13.

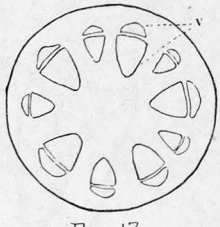

Fig. 17.

Fig. 14.

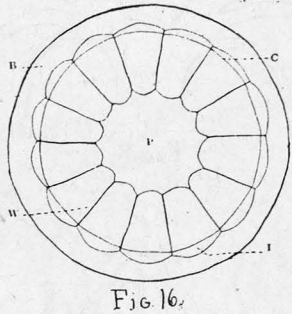

Fig. 16.

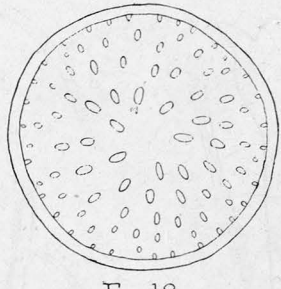

Fig. 18.

Fig. 15.

Fig. 12. Simple umbel.
Fig. 13. Compound umbel.
Fig. 14. Spike.
Fig. 15. Raceme.
Fig. 16. Cross section of a woody dicotyledon stem.
P. pith. W, wood. C, cambium. I, inner bark. B, outer bark.
Fig. 17. Cross section of a herbaceous dicotyledon stem.
V, vascular bundle.
Fig. 18. Cross section of a monocotyledon stem.
V, vascular bundle.

Fig. 19.

Fig. 20.

Fig. 21.

Fig. 19. Petals imbricated.
Fig. 20. Petals valvate.
Fig. 21. Petals convolute.

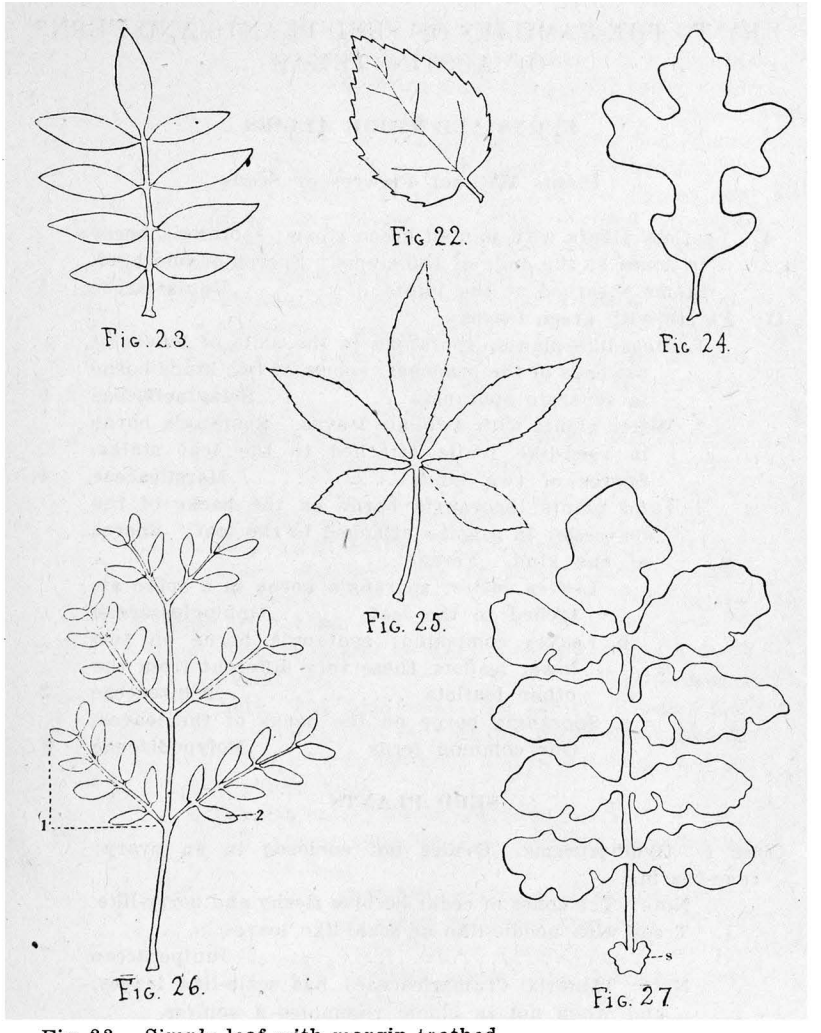

Fig. 22. Simple leaf with margin toothed.
Fig. 23. Pinnately compound leaf with entire leaflets.
Fig. 24. Simple lobed leaf.
Fig. 25. Palmately compound leaf, 5-foliate.
Fig. 26. 2-pinnately compound leaf.
1, primary leaflet. 2, secondary leaflet.
Fig. 27. Pinnately divided leaf.
S, stipule.

KEY TO THE FAMILIES OF SEED PLANTS AND FERNS OF AUSTIN, TEXAS

FERNS AND THEIR ALLIES

Plants Without Flowers or Seeds

I. Leafless plants with jointed green stems; sporangia borne in cones at the ends of the stems. Spores of one kind. Stems sheathed at the joints.....Equisetaceae 5

II. Plants with green leaves:

1. Moss-like plants; sporangia in the axils of leaves at the ends of the branches; spores of two kinds borne in separate sporangia.....Selaginellaceae 6
2. Water plants with 4-foliate leaves. Sporangia borne in seed-like fruits attached to the leaf stalks. Spores of two kinds.....Marsileaceae 4
3. Land plants; sporangia borne on the backs of the leaves, or in a spike attached to the leaf. Spores of one kind. Ferns.
   a. Leaves entire; sporangia borne in a spike attached to the leaf.....Ophioglossaceae 1
   b. Leaves compound; sporangia borne on two lower leaflets, these very different from the other leaflets .....Schizeaceae 2
   c. Sporangia borne on the backs of the leaves. Our common ferns .....Polypodiaceae 3

SEED PLANTS

Class I. Gymnosperms. Ovules not enclosed in an ovary; cone-bearing.

Note: The cones of cedar become fleshy and berry-like.

1. Trees with needle-like or scale-like leaves..... ..... Juniperaceae 7

Note: Tamarix (Tamaricaceae) has scale-like leaves, and when not in bloom resembles a conifer.

2. Shrubs with cylindrical, jointed, green stems sheathed at the joint with scale-like leaves.....Gnetaceae 8

Class II. Angiosperms—Ovules enclosed in an ovary.

Sub-class I. Monocotyledons. Flowers usually on the plan of 3, never of 5; leaves usually parallel veined; vascular bundles of the stem scattered; cotyledon single.

A. Perianth wanting or composed of scales or bristles.

1. Each flower enclosed in a chaffy bract or green scale. Flowers usually clustered in spikelets.

a. Leaves 2-ranked, their sheaths open on the side opposite the blade; stem hollow, round; each flower enclosed in a second inner bract ..... Poaceae 12

b. Leaves 3-ranked, their sheaths not open; stem solid, usually 3-angled: flowers not enclosed in inner bracts.....Cyperaceae 13

Note: The rushes are often confused with the grasses and sedges, but they have a perianth of 6 similar bract-like segments.

2. Flowers grouped in the axils of leaves; delicate submerged water plants.....Zanichelliaceae 10
3. Flowers surrounded by hair-like bristles and closely crowded in a dense spike; flowers male and female, the former above.....Typhaceae 9
4. Flowers clustered on a thick, fleshy axis (spadix)
   a. Spadix enclosed in a leaf-like bract (spathe) ..... Araceae 14
   b. Spadix not enclosed.....Zanichelliaceae 10
5. Very small floating plants, consisting of a fleshy green disc with one or several roots, seldom flowering .....Lemnaceae 15

B. Perianth present

1. Carpels several or many, not united into a compound ovary .....Alismaceae 11

Note: The pond weed (see Zanichelliaceae) has perianth-like outgrowths from the stamens, but no true perianth, and hence should not be placed here.

2. Carpels united into a compound ovary.
   a. Ovary superior, i. e. perianth attached at its base.
      (1) Perianth regular, of six similar chaffy or green bract-like segments. Plants sedge-like or grass-like...Juncaceae 20
      (2) Perianth regular, the sepals and petals unlike
         (a) Plants epiphytic, growing on the branches of trees..... ..... Bromeliaceae 18
         (b) Terrestrial plants; petals very thin and delicate..... ..... Commelinaceae 16
      (3) Perianth regular, its parts similar and petal-like
         (a) Fruit a capsule

*Styles entirely separate from each other or only partially united ..... Melanthaceae 19
**Styles wholly united
Herbaceous land plants with bulbs or corms
Flowers in umbels subtended by an involucre of thin papery bracts..... ..... Alliaceae 21
Flowers solitary or in racemes .....Liliaceae 22
Water plants; perianth parts united into a slender tube ..... Pontederiaceae 17
Trees or shrubby plants with woody stems and large stiff, narrow leaves..... ..... Dracaenaceae 23
(b) Fruit berry-like; stems climbing, armed with prickles..... ..... Smilaceae 24
(4) Perianth irregular, one petal very small .....Commelinaceae 16
b. Ovary inferior.
Stamens 6 .....Leucojaceae 25
Stamens 3 .....Ixiaceae 26
Anther-bearing stamens only 1 or 2; flowers irregular .....Orchidaceae 27

Sub-class II. Dicotyledons: Flowers usually on the plan of 5 or 4; leaves net-veined; vascular bundles of the stem arranged in the form of a hollow cylinder; cotyledons 2.
Division I. Flowers with no corolla and sometimes no calyx.
A. Flowers of two kinds, staminate and pistillate, one or both kinds borne in scaly spikes (aments); trees or shrubs.
1. Staminate flowers in aments, the pistillate solitary or clustered; fruit a nut or acorn.
Leaves pinnately compound, Juglandaceae 28
Leaves simple .....Fagaceae 30
2. Both staminate and pistillate flowers in aments.
Fruits aggregated, fleshy..Artocarpaceae 32
Fruits dry, seeds tufted with white hairs ..... Salicaceae 29

B. Flowers not in aments. (Male flowers in ament-like spikes in Garrya of Nyssaceae.)

1. Calyx wanting. (Or much reduced in Platanaceae.)

a. Trees; flowers monoecious or dioecious.
Flowers in globular heads..... ..... Platanaceae 54
Flowers in clusters..... .....Fraxinus in Oleaceae 95

b. Submerged plants.
Leaves in whorls; flowers in a calyx-like involucre; monoecious; ovary 1-celled ..... Ceratophyllaceae 44
Leaves opposite; ovary 4-celled.... ..... Callitrichaceae 71

c. Herbaceous land plants; capsule 3-celled .....Euphorbiaceae 70
Note: Some of the Euphorbiaceae have staminate and pistillate flowers in a calyx-like involucre, the cluster resembling a single perfect flower. The involucre bears one or more glands, and the glands in some genera bear petal-like appendages.

2. Calyx present, sometimes corolla-like.
(Note: The involucre resembles a calyx in Ceratophyllaceae.)

a. Trees or shrubs; flowers borne in hollow receptacles or in globular heads; monoecious or dioecious .....Artocarpaceae 32

b. Trees or shrubs; flowers not in hollow receptacles or globular heads.

(1) Ovary inferior.
Garrya in Nyssaceae..... 88

(2) Ovary superior.
Ovary 3-celled, stigmas 2-cleft ..... Euphorbiaceae 70
Ovary 1-celled, anthers opening by valves .....Lauraceae 84a
Ovary 1-celled, anthers opening by slits .....Ulmaceae 33
Ovary 2-celled, anthers opening by slits.
Fruit 2-winged ...Aceraceae 75
Fruit 1-winged or wingless.

Leaves opposite...Oleaceae 95
Leaves alternate..Ulmaceae 33
(3) Ovary partly immersed in a fleshy disc, partly inferior..Frangulaceae 77
c. Herbs; ovary superior.
(1) Pistils several or many; stamens many ..... Ranunculaceae 45
(2) Pistil single; stamens few.
(a) Ovary 1-celled.
x. Leaves without stiples.
y. Ovary enclosed in the lower portion of the calyx tube and appearing inferior, calyx corolla-like .. ....Allioniaceae 39
yy. Ovary not enclosed.
Calyx corolla-like, flowers conspicuous, bracts not membranous.
Fruit 3-angled, flower cluster in invalucres, Polygonaceae 34
Fruit a berry or achene —not 3-angled, flowers in racemes ....Petiveraceae 38
Flowers inconspicuous, with dry membranous bracts, Amaranthaceae 36
Flowers inconspicuous, without bracts; plants more or less fleshy ..... Chenopodiaceae 35
xx. Stiples sheathing the stem at the joints.Polygonaceae 34
xxx. Stipules present, not sheathing the stem.
Plants rigid; stipules papery, leaves narrow.... ..... Corrigiolaceae 37
Plants not rigid, leaves broad.
Stipules falling away early ....Petiveraceae 38
Stipules persistent.
Some species with stinging hairs ....Urticaceae 31

(b) Ovary 2-celled; fruit a flat circular pod ...Some species of Lepidium in Brassicaceae 50

(c) Ovary 3-5-celled; flowers perfect; land plants..... ..... Tetragoniaceae 40

(d) Ovary 3-celled; plants monoecious or dioecious .... Euphorbiaceae 70

(e) Ovary 4-celled; water plants ....Callitrichaeceae 71

(f) Ovary 5-10-celled; fruit a berry ..... Petiveraceae 38

(3) Pistil single, stamens more than 10, ovary 3-celled..Euphorbiaceae 70

d. Herbs; ovary inferior.

(Note: In the 4-o'clock family, Allioniaceae, the ovary appears inferior. See c (2), (a) above.

Calyx corolla-like .....Asaraceae 121

Calyx not corolla-like.

Prostrate mud plants..Epilobiaceae 86

Submersed water plants, Gunneraceae 87

Division II. Calyx and corolla both present, the petals not united.

A. Stamens more than twice as many as the petals.

I. Plants leafless or nearly so; stem thorny or prickly, green and fleshy, or woody..... ..... Opuntiaceae 84

II. Trees, shrubs, or woody vines.

1. Ovary superior.

a. Ovary one, 1-celled.

Ovary a single carpel; plants with stone fruits .....Amygdalaceae 57

Ovary a single carpel; fruit a legume ..... Mimosaceae 58

Ovary compound, ovules attached to the walls

Leaves not dotted.....Cistaceae 82

Leaves dotted .....Hypericaceae 81

b. Ovary one, several celled.

Fruit a berry, leaves simple..... ..... Ebenaceae 92

Fruit a stone fruit, leaves twice or thrice compound .....Meliaceae 68

Fruit a capsule.

Flowers perfect, capsule leathery ..... Lythraceae 85
Monoecious or dioecious, capsule 3-celled ..... Euphorbiaceae 70

c. Ovaries many, stamens attached to the calyx ..... Rosaceae 55

2. Ovary inferior, fruit several celled, fleshy ..... Malaceae 56

III. Herbs.

1. Ovaries several, simple....Ranunculaceae 45
2. Ovary single, simple.....Rosaceae 55
3. Ovary single, compound.

a. Ovary 1-celled, ovules attached in the center; succulent plants. Sepals 2. ..... Portulacaceae 41

b. Ovary 1-celled, ovules attached to the walls.

Plants with milky or colored juice ..... Papaveraceae 48
Without milky or colored juice, shrubby.
Leaves dotted .... Hypericaceae 81
Leaves not dotted ....Cistaceae 82

c. Ovary several celled.

(1) Ovary inferior, flowers on the plan of four.....Epilobiaceae 86
(Note: In Malvaceae the ovary appears inferior, because enveloped in the stamen tube.)

(2) Ovary superior.

(a) Flowers monoecious or dioecious; often with milky juice; fruit usually a 3-celled, 3-lobed capsule .....Euphorbiaceae 70

(b) Flowers perfect.

Stamens numerous, filaments united in a column around the style and attached to the petals at base ..... Malvaceae 79
Stamens 10-15, filaments united only at base, free from the petals; leaves 3-foliate .....Oxalidaceae 64
Filaments not united.

Plants viscid, ill-scented, leaves 3-foliate, sepals and petals 4 .....Capparidaceae 51
Plants not viscid or ill-scented; leaves simple.
Petals 4 or 5..... ..... Lythraceae 85
Petals 3...Cistaceae 82

B. Stamens not more than twice as many as the petals.
I. Trees, shrubs, or woody vines.
1. Ovary superior.
a. Pistils 2 or more, separate..... ..... Menispermaceae 46
b. Pistil 1, carpel 1.
(1) Leaves compound, flowers regular, fruit not a legume.
Leaves gland dotted, aromatic ....Rutaceae 66
Leaves not gland-dotted.
Leaves pinnately 3-foliate, leathery, spine-tipped, fruit an edible berry,..... ..... Berberidaceae 47
Leaves not leathery or spine-tipped ..... Spondiaceae 72
(2) Leaves pinnately compound or simple, fruit a legume, flowers mostly irregular.
Leaves simple ....Cercis in Cassiaceae 59
Leaves 2-pinnately compound, flowers small, in dense heads ..... Mimosaceae 58
Leaves 2-pinnately compound, fascicled, flowers larger, not in heads .....Cassiaceae 59
(3) Leaves pinnately compound, occasionally unifoliate, flowers irregular, stamens with filaments usually united.....Fabaceae 61
c. Carpels several, partly united..... ..... Rutaceae 66
d. Pistil compound, 1-celled, leaves small and scale-like..Tamaricaceae 80
e. Pistil compound, several-celled.

(1) Vines climbing by tendrils..... ..... Vitaceae 78
(2) Shrubs or trees, leaves opposite.
Leaves simple or pinnately compound.
Fruit with one wing, Oleaceae 95
Fruit with two wings, Aceraceae 75
Leaves palmately compound.... ....Aesculaceae 74
(3) Shrubs or trees, leaves alternate.
Leaves simple.
Low plants partly herbaceous, ovary 2-lobed..... Rutaceae 66
Trees or bushes.
Calyx tube lined or filled with a fleshy disc..... ..... Frangulaceae 77
No fleshy disc.
Stamens 10...Styracaceae 94
Stamens 4-6, Aquifoliaceae 73
Leaves one pinnate.
Aromatic .....Rutaceae 66
Not aromatic.
Fruit winged..Simarubaceae 67
Fruit berry-like, or a 3-celled capsule .....Sapindaceae 76
Leaves 2 or 3-pinnate..Meliaceae 68
2. Ovary inferior .....Nyssaceae 88
(Note: In Frangulaceae the ovary is immersed in a fleshy disc and appears inferior.)

II. Herbs.
1. Ovaries several, distinct or nearly so.
Succulent plants .....Sedaceae 52
Not succulent.
Juice not milky, carpels 3 or more ..... Ranunculaceae 45
Juice milky, carpels 2.
Stamens attached to the pistil.... ..... Asclepiadaceae 99
Stamens not attached to the pistil ..... Apocynaceae 98
2. Ovary 1-celled, simple:
Flowers regular, fruit a legume, leaves compound .....Mimosaceae 58
Flowers irregular, fruit prickly, indehiscent, leaves simple....Krameriaceae 60

Flowers irregular, fruit usually a legume, leaves compound.
Lateral petals covering the upper in the bud ..... Cassiaceae 59
Upper petal covering the lateral in the bud ..... Fabaceae 61

3. Ovary 1-celled, compound.
a. Ovules attached to the outer walls
Flowers regular, sepals and petals 5; the two outer small and scale-like or wanting; low shrubs or woody herbs ..... Cistaceae 82
Flowers regular, sepals and petals 5' minute plants not more than 1.5 high ..... Saxifragaceae 53
Flowers irregular.
Sepals and petals 5, carpels 3.... ..... Violaceae 83
Sepals 2, petals 4, carpels 2..... ..... Fumariaceae 49
b. Ovules attached to a central column or to the base of the ovary.
(1) Plants succulent, sepals 2.... ..... Portulacaceae 41
(2) Plants not succulent, sepals more than 2.
(a) Stamens as many as the petals and opposite them ..... Primulaceae 91
(b) Stamens twice as many as the petals or fewer; if as many, alternate with them.
Petals narrowed into claws with usually a scale at the junction of claw and blade..... ..... Caryophyllaceae 43
Petals not clawed..... ..... Alsinaceae 42

4. Ovary 1; 2-several-celled.
a. Aquatic plants; flowers usually monocious. ..... Gunneraceae 87
b. Land plants.
(1) Ovary superior.
Ovary 5-celled, sepals 5, petals 5. Styles 5, united into a column ..... Geraniaceae 62

Styles 5, not united; stamens 10 ..... Oxalidaceae 64
Ovary 2-5-celled, or 4-10-celled, stamens 5 with filaments united at the base, corolla falling very easily .. Linaceae 63
Ovary 2-5-celled, stamens 10-12, the alternate ones shorter; leaves pinnately compound ..... Zygophyllaceae 65
Ovary 3-celled, not inflated; flowers monoecious or dioecious ..... Euphorbiaceae 70
Ovary 3-celled, inflated, 3-seeded, stamens 8; slender herbaceous vines .... Sapindaceae 76
Ovary 2-celled, sepals 4, petals 4, stamens 6 (2 or 4 in Lepidium) ..... Brassicaceae 50
Ovary 2-celled, two lobed; low, partly shrubby, aromatic plants with yellow flowers.. ..... Rutaceae 66
Ovary 2-celled (occasionally 5), flowers irregular, papilionaceous; stamens 4 or 8..... ..... Polygalaceae 69
Ovary 2-celled; capsules paired, opening by a round lid, stamens 2 or 3..... Oleaceae 95
Ovary 2-4-celled, petals narrowed at base into slender claws; leaves opposite or whorled .... Caryophyllaceae 43
Ovary several celled, sepals 3, or 5 with the two outer smaller, stamens 8; low shrubs or woody herbs ..... Cistaceae 82
Ovary 2-6-celled, ovules numerous, styles united, anthers versatile, calyx usually with accessory teeth..... Lythraceae 85

(2) Ovary inferior.
Styles united, flowers usually on the plan of 4.... Epilobiaceae 86
Styles 2, with thickened bases, petals 5; flowers usually in flat-topped clusters..... ..... Ammiaceae 89

Division III. Calyx and corolla both present; the petals more or less united.

A. Ovary superior.

I. Stamens free from the corolla; petals only slightly united (united into a 5-toothed cup in Ericaceae).

1. Carpels several, distinct; small, succulent plants.. ..... Sedaceae 52

2. Pistil a single carpel.

a. Flowers regular.

Flowers small, petals not overlapping in the bud ..... Mimosaceae 58

Flowers larger (small in Gleditsia) petals overlapping in the bud.....Cassiaceae 59

b. Flowers irregular.

Fruit not a legume; anther sac opening by pores, ovules 2, seeds, usually 1.....Krameriaceae 60

Fruit a legume.

Upper petal enclosed by the lateral in the bud ..... Cassiaceae 59

Lateral petals enclosed by the upper in the bud .....Fabaceae 61

3. Pistil single, compound.

Flowers regular, ovary 2-10-celled.....Linaceae 63

Flowers irregular, ovary 2-celled.....Polygalaceae 69

II. Stamens attached to the corolla.

1. Stamens as many as the lobes of the corolla and opposite them, or more.

a. Ovary 1-celled; herbs; stamens as many as the corolla lobes; ovules attached in the center.... ..... Primulaceae 91

b. Ovary 1-celled; trees.....Styracaceae 94

c. Ovary several celled; shrubs or trees.

Perfect stamens 5, but with 5 rudimentary petal-like ones alternating with them.....Sapotaceae 93

Stamens 8-16, filaments cohering at base; anthers opening lengthwise.....Styracaceae 94

Stamens 10, filaments free, anthers opening by pores ..... Ericaceae 90

Stamens 16-20, filaments not cohering, Ebenaceae 92

2. Stamens as many as the corolla lobes and alternate with them, or fewer.

a. Corolla transparent, papery or parchment-like; fruit opening by a round lid.....Plantaginaceae 116

b. Corolla not transparent or paper.

(1) Ovary of 3-6 carpels, or 3-6 celled.

(a) Trees or shrubs.

Leaves alternate.

Ovary 1-celled, or incompletely 4-celled; fruit with 2 nutlets; flowers perfect; leaves rough....Ehretiaceae 107
Fruit with 4-8 nutlets; more or less dioecious; leaves smooth..... Aquifoliaceae 73
Leaves opposite .....Verbenaceae 109
(b) Herbs.
x. Stamens 5.
y. Seeds few, corolla lobes convolute in the bud, ovary not deeply lobed.
z. Fruit a capsule.
Calyx lobes imbricated; mostly climbing vines or prostrate herbs ..... Convolvulaceae 101
Calyx lobes valvate in the bud ..... Polemoniaceae 104
zz. Fruit consisting of 4 bony nutlets; style or stigma with a glandular ring, Heliotropiaceae 108
yy. Seeds few; corolla lobes not convolute in the bud; ovary deeply lobed, the style arising between the lobes; fruit 2-4 bony nutlets; plants mostly hairy, Boraginaceae 106
yyy. Seeds many; corolla lobes not convolute in the bud; styles united.. ..... Solanaceae 105
xx. Stamens 2 or 4.
Ovary not lobed, style arising from its apex .....Verbenaceae 109
Ovary 4-lobed; style arising from between the lobes.....Lamiaceae 110
(2) Ovary of 2 carpels.
(a) Carpels distinct except sometimes at the apex.
x. Styles attached to the top of the ovary; usually with milky juice
Styles united, stamens distinct; pollen loose, granular..... ..... Apocynaceae 98
Styles distinct, stigmas united in a disc; pollen cohering in waxy masses; stamens converging around the stigma, Asclepiadaceae 99
xx. Styles attached to the base of the

ovary; creeping plants, without milky juice ..... Dichondraceae 100

(b) Carpels united (ovary deeply lobed in several families).

x. Ovary 1-celled.

y. Flowers irregular.

Water plants; leaves bladder-bearing ..... Pinguiculariaceae 113

Land plants; leaves not bladder-bearing.

Trees, shrubs, or woody vines.. ..... Bignoniaceae 114

Herbs ..... Martyniaceae 115

yy. Flowers regular.

Trees ..... Ehretiaceae 107

Herbs.

Leaves opposite, blades simple; ovules numerous, Gentianaceae 97

Leaves usually alternate, variously lobed and divided, or entire; ovules few or numerous.. ..... Hydroleaceae 103

xx. Ovary 2-celled.

y. Flowers irregular, sometimes only slightly so.

z. Ovules numerous.

w. Trees, shrubs, or woody vines; flowers large; seeds winged .... Bignoniaceae 114

ww. Herbs.

Stamens 4, equal; a fifth rudmentary, or lacking; leaves alternate; flowers nearly regular ....Petunia in Solanaceae 105

Stamens 4, in unequal pairs, or only 2; leaves usually opposite.

Corolla lobes convolute in the bud.....Acanthaceae 112

Corolla lobes imbricated in the bud, Rhinanthaceae 111

zz. Ovules few.

Fruit 2 or 4 bony nutlets, or drupe-like ..... Verbenaceae 109

Fruit a capsule, or winged.

Trees; fruit winged; leaves compound ..... Oleaceae 95
Herbs: fruit a capsule.
Capsules in pairs, Oleaceae 95
Capsules not paired.....
..... Acanthaceae 112
yy. Flowers regular.
z. Parasitic vines without green leaves ..... Cuscutaceae 102
zz. Not parasites.
w. Ovules many.
Styles 2, distinct.
Leaves opposite .....
..... Spigeliaceae 96
Leaves alternate .....
..... Hydroleaceae 103
Styles united, Solanaceae 105
ww. Ovules few.
Stamens 2 or 4.
Leaves with stipules....
..... Spigeliaceae 96
Leaves without stipules
..... Oleaceae 95
Stamens 5.
Leaves with stipules....
..... Spigeliaceae 96
Leaves without stipules
Fruit separating into 2 or 4 bony nutlets....
. .... Heliotropiaceae 108
Fruit a capsule.....
..... Convolvulaceae 101

B. Ovary inferior, sometimes only partly so.
I. Green parasitic plants growing on the branches of trees ..... Loranthaceae 117
II. Not parasites.
1. Stamens with their filaments free from the corolla tube.
Flowers perfect.
Flowers regular ..... Campanulaceae 123
Flowers irregular ..... Lobeliaceae 124
Monoecious or dioecious.....Cucurbitaceae 122
2. Stamens with filaments adnate to the corolla tube.
a. Flowers aggregated in flower-like heads subtended by a calyx-like involucre; calyx wanting

or represented by scales, hairs, or bristles, or a mere crown or border; ovary 1-celled, 1-seeded.

Flowers very small, in inconspicuous heads; monoecious or dioecious; stamens not united ..... Ambrosiaceae 125

Flowers in conspicuous heads; stamens with their anthers united forming a tube around the style.

Flowers all alike and regular or bilabiate, or else the central flowers regular and the marginal with strap-shaped corollas; juice usually not milky ..... Carduaceae 126

Flowers all alike; corollas strap-shaped; juice milky ..... Cichoreaceae 127

b. Flowers not aggregated in flower-like heads.

(1) Ovary only partially inferior.

Leaves alternate; ovary 1-celled, with numerous ovules attached in the center... ..... Primulaceae 91

Leaves opposite or whorled.... Rubiaceae 118

(2) Ovary completely inferior.

Leaves alternate; monoecious or dioecious vines; anthers contorted; fruit a fleshy or dry berry ..... Cucurbitaceae 122

Leaves opposite.

Ovary 3-celled, two of the cells abortive, ovule 1; herbs..... Valerianaceae 120

Ovary 2-5-celled (sometimes 1-celled in Lonicera).

Anthers versatile; shrubs, vines, or trees ..... Caprifoliaceae 119

Anthers not versatile, shrubs or trees. ..... Rubiaceae 113

KEY TO THE GENERA

FERNS AND THEIR ALLIES. PTERIDOPHYTES.

1. Adder's-tongue Family. Ophioglossaceae.

Leaves oval, 2-5 inches long; spores borne in a slender spike attached to a leaf..... (1)

(1) Ophioglossum, Adder's tongue.

2. Curly-grass Family. Schizeaceae.

Leaves large, pinnately compound, rather leathery; sporangia borne on the two modified lower leaflets..... (1)

(1) Anemia.

3. Fern Family. Polypodiaceae.

Sporangia borne on the edges of the leaves, covered by the reflexed margins.

Leaves much divided; leaflets fan-shaped, thin; indusium not continuous around the margin..... (1)

Leaflets oval or oblong, thick and leathery, not toothed or incised; indusium continuous around the margin..... (2)

Leaflets not leathery, pointed, incised, not fan-shaped.... (3)

Sporangia not covered by the reflexed margins of the leaflets.

Leaves whitened on the under surface, much divided, small ..... (4)

Leaves covered on the under surface with red-centered gray scales; climbing ferns, found on tree trunks..... (5)

Leaves not whitened or covered with scales below.

Indusia round; leaves often 2-3 feet long, leaflets narrow, cleft $\frac{2}{3}$ of the way to the mid-vein..... (6)

Indusia elongated, leaf blades 3-10 inches long, once pinnate; leaflets not lobed..... (7)

(1) Adiantum, Maiden hair fern.
(2) Pellaea, Cliff Brake.
(3) Cheilanthes, Lip Fern.
(4) Notholaena.
(5) Polypodium, Polypody.
(6) Dryopteris.
(7) Asplenium, spleen-wort.

4. Marsilea Family. Marsileaceae.

Creeping plants growing in wet places; leaves 4-foliate, resembling a four-leafed clover..... (1)

(1) Marsilea, Water Fern.

5. Horse-tail Family. Equisetaceae.

(1) Equisetum, Horse-tail, Scouring rush.

6. Selaginella Family. Selaginellaceae.

Moss-like plants. One species is a delicate, creeping plant found in wet ground; the other is partly erect and grows in dense tufts in dry places..... (1)

(1) Selaginella.

SEED PLANTS.

CLASS I. GYMNOSPERMS.

7. Juniper Family. Juniperaceae.

Deciduous trees with needle leaves; seeds in dry cones..... (1)
Evergreen trees with scale-like leaves; seeds in fleshy, berry-like cones ..... (2)

(1) Taxodium, Cypress, Swamp Cypress, Bald Cypress.
(2) Sabina, Cedar. Includes Mountain Cedar and Red Cedar.

8. Gnetum Family. Gnetaceae.

(1) Ephedra, Joint Fir.

CLASS II. ANGIOSPERMS.

9. Cat-tail Family. Typhaceae.

(1) Typha, Cat-tail.

10. Pondweed Family. Zanichelliaceae.

Slender, delicate, branching plants with narrow, grass-like leaves; flowers in the axils of the leaves; without perianth; submerged water plants..... (1)
Submerged except the flower cluster; flowers in dense spikes;

carpels 4, distinct; stamens, 4, each bearing a sepal-like apendage; perianth wanting ..... (2)

(1) Zanichellia, Horned Pondweed.
(2) Potamogeton, Pondweed.

11. Water-plantain Family. Alismaceae.

Partly submerged; monoecious; the staminate flowers above; flowers conspicuous, with 3 green sepals and 3 white petals; stamens and carpels many, distinct; leaf blades oval or elongated, 2-6 inches long ..... (1)

(1) Sagittaria, Arrow-leaf.

12. Grass Family, Poaceae.

We have 60 or more species of grasses and 40 genera, but, as they are very difficult to identify, the names and descriptions are omitted.

13. Sedge Family. Cyperaceae.

The genera of sedges are omitted for the same reason as the grasses.

14. Arum Family. Araceae.

Spadix prolonged several inches beyond the spathe and tapering to a slender tip. Spathe 1-4 inches long..... (1)

(1) Muricauda, Green Dragon.

15. Duckweed Family. Lemnaceae.

Plant body 1/16 to 3/16 inch long, oval, with a single root; common in stagnant pools, forming a green scum over the surface of the water..... (1)

(1) Lemna, Duckweed.

16. Spiderwort Family. Commelinaceae.

Petals unequal, two large, blue, the third very small, white; only 2 or 3 of the stamens pollen-bearing; flower clusters subtended by short, more or less triangular, folded spathe.... (1)
Petals equal; fertile stamens 5 or 6; flower clusters subtended by leaf-like bracts ..... (2)
One petal small; fertile stamens 6, but three of them smaller; flower cluster subtended by a leaf-like bract..... (3)

(1) Commelina, Day Flower.
(2) Tradescantia, Spiderwort.
(3) Tinantia.

17. Pickerel-weed Family. Pontederiaceae.

Submerged except the flowers; perianth yellow, prolonged into a long tube; leaves narrow ..... (1)

(1) Heteranthera, Water Star-grass.

18. Pine Apple Family. Bromeliaceae.

Weak, slender plants with silvery gray stems and leaves, hanging in long festoons from the branches of trees. Common in the valleys ..... (1)
Similar to the preceding, but with shorter, stiffer stems; growing in roundish masses. Common on trees on the uplands.. (2)

(1) Dendropogon, Long Moss, Spanish Moss.
(2) Tilandsia, Ball Moss.

19. Bunch-flower Family. Melanthaceae.

Flowers small, in spikes or spike-like racemes at the end of a slender naked stalk; plants about 2 feet high, with slender grass-like leaves ..... (1)
Each flower on a stalk 1-2 inches long; flowers in racemes at the end of a leafy stalk; leaves ½ to 1 inch wide, rather stiff, grass-like; plants stout ..... (2)

(1) Schoenocaulon.
(2) Toxicoscordion.

20. Rush Family. Juncaceae.

Sedge-like plants; flowers with a perianth of six green bract-like sepals and petals..... (1)

(1) Juncus, Rush.

21. Onion Family, Alliaceae.

Plants with the characteristic onion odor; flowers white or pink; filaments not united ..... (1)
Similar to the above, but without the characteristic onion odor; flowers white, in loose clusters ..... (2)
Without onion odor; flowers large, blue; filaments united forming a short tube which is attached to the perianth..... (3)

(1) Allium, Wild onion, Garlic.
(2) Nothoscordium, Crow-poison, False Garlic.
(3) Androstephium.

22. Lily Family. Liliaceae.

Plants about 6 inches to 1 foot high, with large blue or pale flowers in a raceme; leaves basal, narrow, elongated..... (1)

(1) Quamasia, Wild Hyacinth.

23. Yucca Family. Dracaenaceae.

Leaves narrow, elongated, stiff and woody, the edges with either thread-like white fibers or a yellow saw-toothed margin; flowers white, large, in clusters 2-3 feet long..... (1)
Leaves not margined, rough-edged in one species, 2-4 feet long, very slender and flexible, crowded on a short stem. Flower clusters similar to Yucca, but flowers smaller..... (2)

(1) Yucca, Bear Grass, Spanish Bayonet.
(2) Nolina, Slender Bear Grass.

24. Smilax Family. Smilaceae.

Climbing vines, abundantly armed with thorns and prickles; berries black ..... (1)

(1) Smilax, Stretch berry, Green-briar.

25. Amaryllis Family. Leucojaceae.

Flowers white, about three inches long, on naked stalks; perianth parts partly united; leaves strap-shaped; blooming abundantly several days after a rain..... (1)
Similar to the preceding, but flowers yellow and smaller.... (2)

(1) Cooperia, Rain Lily.
(2) Atamosco, Atamosco Lily.

26. Iris Family. Ixiaceae.

Flowers about 1½ inches in diameter, bright blue to white; styles 2-cleft or 2-parted..... (1)
Perianth not more than ½ to ¾ inch in diameter; blue or purple. The common species has a conspicuous yellow center. Styles united ..... (2)

(1) Nemastylis.
(2) Sisyrinchium, Blue-eyed Grass.

27. Orchid Family. Orchidaceae.

Flowers small, white, borne in a raceme. Flowering stalk scaly; leaves basal. ..... (1)

(1) Ibidium, Ladies' Tresses.

28. Walnut Family. Juglandaceae.

Nut enclosed in an involucre which splits at maturity, shell smooth ..... (1)
Fruit not enclosed in an involucre, the outer part fleshy, the inner hard, forming the rough black nut..... (2)

(1) Hicorya, Pecan.
(2) Juglans, Walnut.

29. Willow Family. Salicaceae.

Large trees with broad leaves..... (1)
Slender trees with narrow leaves..... (2)

(1) Populus, Cottonwood, Poplar.
(2) Salix, Willow.

30. Beech Family. Fagaceae.

Quercus, Oak.

31. Nettle Family. Urticaceae.

Leaves toothed, with stinging hairs..... (1)
Leaves toothed, without stinging hairs; plants nettle-like.... (2)
Leaves not toothed, without stinging hairs; weak plants with slender stems and thin leaves..... (3)

(1) Urtica, Nettle.
(2) Boehmeria, False Nettle.
(3) Parietaria, Pellitory.

32. Mulberry Family. Artocarpaceae.

Leaves thick, rough above, very hairy below, some of them lobed; fruit not edible ..... (1)
Leaves smooth or slightly hairy, some lobed; fruit edible.... (2)
Branches thorny; fruits aggregated in a green ball the size of an orange; leaves not lobed..... (3)

(1) Broussonetia, White Mulberry.
(2) Morus, Mulberry.
(3) Toxylon, Bois D'Arc, Osage Orange, Bow-wood.

33. Elm Family. Ulmaceae.

Fruit a berry-like drupe; bark peculiarly stratified..... (1)
Fruit dry, flat and winged..... (2)

(1) Celtis, Hackberry.
(2) Ulmus, Elm.

34. Buckwheat Family. Polygonaceae.

Flowers in involucres; stem not conspicuously sheathed at the joints ..... (1)
Flowers not in involucres; stems conspicuously sheathed at the joints.
  Slender vines with small white or yellowish flowers; one of the sepals winged..... (2)
  Not vines;
    Flowers pink or white, in terminal racemes..... (3)
    Flowers greenish, sepals 6, the 3 inner winged and one or more bearing a thickened whitish ridge-like swelling ..... (4)

(1) Eriogonum.
(2) Tiniaria, Black Bindweed.
(3) Persicaria, Smartweed, Knotweed.
(4) Rumex, Dock.

35. Goosefoot Family. Chenopodiaceae.

Sepals more than 1; flowers small, in greenish clusters; leaves often mealy; very common, homely weeds..... (1)
Sepal 1; flowers small; plants prostrate..... (2)

(1) Chenopodium, Goosefoot. The genus includes Lambs Quarter, and Wormseed.
(2) Monolepis.

36. Amaranth Family. Amaranthaceae.

Anthers with 2 pollen sacs.
  Filaments united below; ovules 2-8. Smooth perennials with upright stems; leaves opposite, ovate to triangular; flowers in slender terminal spikes..... (1)
  Filaments free; ovule 1; flowers small, subtended by green or reddish bracts; very common weeds of homely aspect.... (2)
Anthers with only 1 pollen sac.

Stamens attached to the perianth; prostrate hairy plants; flowers clustered in the axils of the leaves..... (3)
Stamens not attached to the perianth.
Filaments united into a short cup at the base.
No sterile stamens; leaves opposite; basal leaves elongated, stem leaves shorter; flowers subtended by whitish bracts ..... (4)
Sterile stamens alternating with the fertile ones; prostrate plants with forking stems; bracts whitish (5)
Filaments united into a long tube at the base; stems elongated, spreading; plants white-woolly; flowers densely white woolly in elongated spikes; leaves opposite, 1-several inches long, narrow..... (6)

(1) Celosia.
(2) Amaranthus, Pigweed, Amaranth.
(3) Brayulinea.
(4) Gossypianthus.
(5) Alternanthera.
(6) Froelichia.

37. Whitlow-wort Family. Corrigiolaceae.

Small stiff plants, with slender, much-branched stems, linear leaves and silvery stipules; flowers small, yellow, or almost white ..... (1)

(1) Paronychia, Whitlow-wort, Nail-wort.

38. Poke-weed Family. Petiveraceae.

Ovary 1-celled; berry red; plants 1-2 feet tall; flowers small, white, in racemes ..... (1)
Ovary 5-12 celled; fruit dark purple; plants 3-4 feet tall, stems and leaves smooth ..... (2)

(1) Rivina.
(2) Phytolacca, Poke-weed, Pokeberry.

39. Four O'clock Family. Allioniaceae.

Flowers subtended by a calyx-like involucre of united bracts:
Involucre unchanged in fruit; flower large, 1-2½ inches long ..... (1)
Involucre becoming yellowish and papery in fruit, conspicuous after the flowers have fallen away..... (2)

Flowers without conspicuous involucre; flowers very small, red, pink, or white ..... (3)

(1) Mirabilis, Four O'clock.
(2) Allionia.
(3) Boerhaavia.

40. Carpet-weed Family. Tetragoniaceae.

Prostrate herbs with forking stems; leaves in whorls of 4-8; flowers small, white ..... (1)

(1) Mollugo, Carpet-weed.

41. Purslane Family. Portulaceae.

Perennials, from tuber-like corms; leaves linear, fleshy; flowers white or pink, delicately pink-nerved; capsule splitting lengthwise ..... (1)
Succulent annuals; ovary partly inferior; capsule 1-celled, opening by a round lid ..... (2)
Perennial, with thickened stems; succulent; flower-bearing stems slender, wire-like; leaves linear; capsule opening lengthwise ..... (3)

(1) Claytonia, Spring Beauty.
(2) Portulaca. Includes the common "Pussley."
(3) Talinum.

42. Chickweed Family. Alsinaceae.

Petals not 2-cleft or 2-parted, sometimes notched; capsule globose to oblong, opening by 4-6 valves.
Styles as many as the sepals ..... (1)
Styles fewer than the sepals ..... (2)
Petals 2-cleft or 2-parted. Sometimes only notched in Cerastium.
Capsule short, 6-valved, or rarely 8 ..... (3)
Capsule long, cylindric, opening at the apex by 10 or 8 tooth-like valves; plants usually hairy or viscid; capsules often curved ..... (4)

(1) Sagina, Pearlwort.
(2) Arenaria, Sandwort.
(3) Alsine, Chickweed.
(4) Cerastium, Mouse-eared Chickweed.

43. Pink Family. Caryophyllaceae.

Flowers white, lasting only a short time. A sticky secretion on the stem entangles small insects..... (1)

(1) Silene, Sleepy Catch-fly.

44. Hornwort Family. Ceratophyllaceae.

Submerged; leaves very numerous, stiff, finely divided..... (1)

(1) Ceratophyllum, Hornwort.

45. Crowfoot Family. Ranunculaceae.

Flowers irregular; one of the sepals prolonged into a hollow spur ..... (1)
Flowers regular:
  All the petals prolongled into hollow spurs..... (2)
  Sepals spurred; plants very small; receptacle elongating greatly in fruit ..... (3)
  Flowers not spurred.
    Perianth undifferentiated, petal-like.
      Low herbs; perianth parts 6-20..... (4)
      Vines.
        Flowers large; perianth parts leathery, crimson or purple; converging ..... (5)
        Flowers small, white; perianth parts spreading.... (6)
    Perianth differentiated into green sepals and colored petals.
        Petals yellow, each with a scale-like nectar gland at the base ..... (7)
        Petals orange or red, without nectar glands..... (8)

(1) Delphinium, Larkspur.
(2) Aquilegia, Wild Columbine.
(3) Myosurus, Mouse-tail.
(4) Anemone.
(5) Viorna, Leather-flower.
(6) Clematis, Granddaddy Gray-beard, Virgin's Bower.
(7) Ranunculus, Crowfoot, Buttercup.
(8) Adonis.

46. Moonseed Family. Menispermaceae.

Climbing vines, with small white flowers and beautiful clusters of bright red berries..... (1)

(1) Cebatha, Coral Bead.

47. Barberry Family. Berberidaceae.

Bushes with spiny, 3-foliate leaves; flowers yellow, opening early in the spring; berries red, edible..... (1)

(1) Berberis, Agarita, Chaparral.

48. Poppy Family. Papaveraceae.

Flowers large, white; stems and leaves prickly; thistle-like.. (1)
Flowers red ..... (2)

(1) Argemone, Wild Poppy.
(2) Papaver, Poppy.

49. Fumitory Family. Fumariaceae.

Flowers very irregular, yellow, one petal spurred; leaf blades finely divided ..... (1)

(1) Capnoides.

50. Mustard Family. Brassicaceae.

Pods flattened contrary to the narrow partition.
  Pods triangular or heart-shaped, wingless..... (1)
  Pods nearly circular, wing-margined at least at the apex; peppery to the taste..... (2)
Pods flattened parallel to the broad partition.
  Pods oval; plants soft-hairy..... (3)
  Pods elongated; plants not hairy.
    Anthers sagittate ..... (4)
    Anthers not sagittate ..... (5)
Pods only slightly or not at all flattened.
  Pods globular ..... (6)
  Pods elongated.
    Leaves finely dissected ..... (7)
    Leaves not finely dissected.
      Pods with a prominent beak ..... (8)
      Pods not beaked ..... (9)

(1) Bursa, Shepherd's Purse.
(2) Lepidium, Pepper Grass.
(3) Draba, Whitlow Grass.
(4) Streptanthus.
(5) Arabis, Rock Cress.
(6) Lesquerella, Bladder Pod.
(7) Sophia.
(8) Brassica, Mustard.
(9) Roripa. Includes Water Cress.

51. Caper Family. Capparidaceae.

Homely weeds with a heavy disagreeable odor; flowers purplish; leaves 3-foliate ..... (1)

(1) Polanisia, Clammy Weed.

52. Orpine Family. Sedaceae.

Small succulent herbs, with almost cylindrical leaves; flowers yellow, pale pink, or white..... (1)
Minute annuals, with very slender reddish stems and small red flowers; growing in mud holes..... (2)

(1) Sedum, Stone Crop.
(2) Tillaestrum.

53. Saxifrage Family. Saxifragaceae.

Plants very small, growing in moss-like patches; flowers white or yellow ..... (1)

(1) Lepuropetalon.

54. Plane-tree Family. Platanaceae.

Trees with thin, smooth, scaly bark; flowers and fruits in globular heads ..... (1)

(1) Platanus, Sycamore.

55. Rose Family. Rosaceae.

Prickly, trailing shrubs, with 3-foliate leaves..... (1)
Perennial herbs; style jointed and angled; leaves lobed, 3-divided, or pinnately compound..... (2)

(1) Rubus, Dewberry, Blackberry.
(2) Geum, Avens.

56. Malaceae. Apple Family.

Small thorny trees; fruit red, apple-like; flowers white..... (1)

(1) Crataegus, Hawthorne.

57. Plum Family. Amygdalaceae.

Fruit with a somewhat flattened stone; flowers opening before the leaves ..... (1)
Stone almost globular; flowers opening after the leaves..... (2)

(1) Prunus, Wild Plum.
(3) Padus, Wild Cherry.

58. Mimosa Family. Mimosaceae.

Trees or tall shrubs; pods not flat.
  Stamens very numerous; leaflets very small; plants unarmed (1)
  Stamens 10; leaflets about ½-2 inches long..... (2)
Spreading shrubs or herbs.
  Stamens numerous; upright shrubs..... (3)
  Stamens not more than twice as many as the petals.
    Upright, thorny shrubs; pods prickle-armed, flat..... (4)
    Prostrate; stems armed with recurved prickles; pods prickly, 1-4-angled, flat..... (5)
    Perennial herbs, or shrubby; unarmed; pods unarmed.. (6)

(1) Vachellia, Huisache.
(2) Prosopis, Mesquite.
(3) Acacia.
(4) Mimosa, Cat-claw.
(5) Morongia, Sensitive Briar, Wild Sensitive Plant.
(6) Acuan.

59. Senna Family. Cassiaceae.

Herbs ..... (1)
Trees.
  Leaves simple, round; flowers purple, appearing before the leaves ..... (2)
  Leaves compound.
    Armed with long, branched thorns; flowers small, greenish; pods large, flat..... (3)
    Thorns short, simple or 3-branched; flowers conspicuous, yellow; pods 3-5 inches long, constricted between the seeds; bark smooth ..... (4)

(1) Cassia, Senna.
(2) Cercis, Red-bud.
(3) Gleditsia, Honey Locust.
(4) Parkinsonia, Horse-bean, Retama.

60. Krameria Family. Krameriaceae.

Stems prostrate, slender; flowers irregular, red-purple..... (1)

(1) Krameria.

61. Pea Family. Fabaceae.

Shrubs or trees.
Stamens 10; filaments free or nearly so; petals 5..... (1)
Stamens 10; with filaments united.
Much-branched shrubs; flowers small, white; fruit small, 2-4-seeded; plants with a disagreeable odor..... (2)
Shrubs with slender branches; fruit 4-sided, 4-winged; flowers yellow ..... (3)
Flowers small, purple, in spike-like racemes; pod 1-2-seeded; corolla of only 1 petal..... (4)
Herbs.
Leaves with tendrils.
Style flattened, hairy along the inner side..... (5)
Style not flattened, with a tuft of hairs at the tip..... (6)
Leaves without tendrils.
Fruit not separating into joints when mature, dehiscent.
Stamens with all the filaments united.
Anthers of two kinds; leaves not gland-dotted..... (7)
Anthers alike; leaves gland-dotted.
Leaves pinnately compound.
Petals attached to the tube of the filaments; stamens 9 or 10..... (8)
Petals not attached to the tube of the filaments; stamens 10, one almost free; flowers orange-red ..... (9)
Petals not attached to the stamen tube; stamens 5 ..... (10)
Leaves palmately 5-foliate ..... (11)
Anthers alike; leaves not gland-dotted; flowers 2 inches long or longer..... (12)
Stamens with filaments united in two groups, usually with one stamen free and the other nine united.
Leaf blades 3-foliate, sometimes 1-foliate in Lotus.
Leaves resinous-dotted; flowers yellow..... (13)
Leaves not resinous-dotted.
Flowers 2 inches or more long..... (12)
Flowers ½ inch long or smaller.
Leaflets toothed.
Flowers very small, in racemes.

Pods coiled; flowers yellow or purple..(14)
Pods not coiled; flowers yellow or white..(15)
Flowers in round heads, white or pink.....(16)
Leaflets not toothed; corolla pink.....(17)
Leaf blades more than 3-foliate.
Leaves palmately 5-foliate..... (11)
Leaves pinnate.
Prostrate plants with orange-red flowers..... (9)
Tall herbs with large yellow flowers, and slender pods 6-12 inches long .....(18)
Low plants with blue, purple or whitish flowers.
Pods globular, fleshy, plum-like, about 1 inch in diameter .....(19)
Pods ovoid to oblong.....(20)
Pods long and narrow.....(21)
Pods narrowly conic, with awl-shaped tips...(22)
Fruit indehiscent, separating when mature into joints.
Sometimes only 1 joint in Lespedeza.
Joints 1 or 2, not adhesive; calyx without bractles(23)
Joints several, adhesive, flat; calyx with bractlets at the base.....(24)

(1) Sophora, Mountain Laurel.
(2) Eysenhardtia.
(3) Daubentonia, Rattle-box.
(4) Amorpha, False Indigo.
(5) Lathyrus.
(6) Vicia, Vetch.
(7) Lupinus, Blue Bonnet, Buffalo Clover.
(8) Parosela.
(9) Indigofera, Wild Indigo.
(10) Petalostemon.
(11) Psoralea.
(12) Clitoria.
(13) Dolicholus.
(14) Medicago. Includes Burr Clover and Alfalfa.
(15) Trifolium, Clover.
(16) Melilotus, Sweet Clover.
(17) Lotus.
(18) Sesban.
(19) Geoprumnon, Ground Plum.
(20) Astragalus.
(21) Hamosa.
(22) Oxytropis.
(23) Lespedeza, Bush Clover.
(24) Meibomia, Beggar's Tick.

62. Geranium Family. Geraniaceae.

Fertile stamens 5, alternating with 5 sterile filaments: fruit similar to Geranium; flowers deep pink or purple..... (1)
Fertile stamens 10, 5 longer, alternating with 5 shorter; lobes of the capsule separating elastically from the axis and curling backward; flowers white or pale pink..... (2)

(1) Erodium, Wild Geranium.
(2) Geranium, Wild Geranium.

63. Flax Family. Linaceae.

Flowers yellow, or with a red center; corolla falling very readily (1)

(1) Cathartolinum.

64. Wood-sorrel Family. Oxalidaceae.

Leaves 3-foliate, sour, each leaflet very deeply lobed, flowers large, violet ..... (1)
Leaves 3-foliate, sour, leaflets not deeply lobed; flowers yellow (2)

(1) Ionoxalis, Violet Wood-sorrel.
(2) Xanthoxalis, Yellow Wood-sorrel.

65. Caltrop Family. Zygophyllaceae.

Prostrate herbs with pinnately compound leaves and yellow flowers; fruit a beaked capsule..... (1)
Similar to the preceding, but the fruits armed with stout spines (2)

(1) Kallstroemia, Caltrop.
(2) Tribulus, Bur-nut, Sand-bur.

66. Rue Family. Rutaceae.

Shrubs or trees.
Spine-armed; aromatic; leaves pinnately compound..... (1)
Unarmed; leaves pinnately 3 foliate; fruit flat, round winged (2)
Low shrubby herbs; aromatic; flowers small, yellow; fruit 2-lobed ..... (3)

(1) Fagara, Prickly Ash, Toothache Tree.
(2) Ptelea, Hop Tree, Skunk Bush.
(3) Thamnosma.

67. Quassia Family. Simarubaceae.

Leaves large, pinnate; leaf scars large; fruit winged; a common shade tree ..... (1)

(1) Ailanthus, Tree of Heaven.

68. Mahogany Family. Meliaceae.

Leaves very large, 2-3-pinnately compound..... (1)

(1) Melia, Chinaberry.

69. Milkwort Family. Polygalaceae.

Low herbs with small white or purple irregular flowers; fruit a 2-celled flat capsule; stamens 8..... (1)

(1) Polygala, Milkwort.

70. Spurge Family. Euphorbiaceae.

Shrubs or trees; monoecious or dioecious.
  Leaves small, with toothed, wavy or crinkled margins..... (1)
Herbs.
  Flowers not in a perianth-like involucre.
    Tall, with large, deeply palmately lobed leaves..... (2)
    Low plants.
      Ovules 2 in each cavity of the ovary; stamens 3..... (3)
      Ovule 1 in each cavity of the ovary
        With stinging hairs.
          Large coarse herbs, 2 to three feet high, flowers conspicuous, white; stamens 10-30..... (4)
          Small plants; stamens 3-6..... (5)
        Without stinging hairs.
          Corolla present in either staminate or pistillate flowers or both, sometimes represented by glands in Croton.
            Stamens 3-22; filaments not united into a column; plants usually white-hairy, or scaly; usually with a characteristic odor ..... (6)
            Filaments united into a column..... (7)
          Corolla wanting.
            Stamens 4-15; filaments united into a column (7)
            Stamens 8-20; filaments united only at base (8)
            Stamens 2 or 3; filaments free; stems stout; stems and leaves smooth..... (9)

Flowers in a perianth-like involucre; involucre bearing one or more glands; perianth absent or rudimentary.
Glands with more or less petal-like appendages:
Leaves opposite; plants without petal-like bracts.....(10)
Leaves alternate on the upper part of the stem; upper bracts white-edged, petal-like.....(11)
Glands without petal-like appendages.
Involucre with 4 glands; stem repeatedly and regularly branching, terminating in a more or less flat-topped flower cluster .....(12)
Involucre with 1 gland, occasionally 4; stem unbranched or branching irregularly .....(13)

(1) Bernardia.
(2) Ricinus, Castor Oil Plant, Castor Bean,
(3) Phyllanthus.
(4) Cnidoscolus, Bull Nettle.
(5) Tragia.
(6) Croton.
(7) Ditaxis.
(8) Acalypha, Three-seeded Mercury.
(9) Stillingia, Queen's Delight.
(10) Chamaesyce, Spurge.
(11) Dichrophyllum, Snow-on-the-Mountain.
(12) Tithymalus, Spurge.
(13) Poinsettia.

71. Water Starwort Family. Callitrichaceae.

Calitriche, Water Starwort.

72. Sumac Family. Spondiaceae.

Fruit smooth, white or yellow; climbing vines or upright shrubs, with glossy 3-foliate thin leaves..... (1)
Fruit hairy, red; shrubs or trees; leaves pinnately 3-many foliate ..... (2)

(1) Rhus, Poison Ivy and Poison Oak.
(2) Schmaltzia, Sumac.

73. Holly Family. Aquifoliaceae.

Shrubs with bright red berries and small leaves..... (1)

(1) Ilex, Holly and Yaupon.

74. Buckeye Family. Aesculaceae.

Small trees with red blossoms in large clusters; leaves large, palmately compound ..... (1)

(1) Aesculus, Buckeye.

75. Maple Family. Aceraceae.

Trees with pinnately compound leaves; leafets compound, toothed; fruit 2-winged ..... (1)

(1) Rulac, Box Elder, Ash-leaved Maple.

76. Soapberry Family. Sapindaceae.

Delicate vines, climbing by tendrils; flowers small, white; pods inflated ..... (1)
A common shade tree; leaves pinnately compound; fruit yellow, berry-like ..... (2)
A shrub or small tree; leaves pinnately compound; flowers pink; fruit a 3-celled, 3-lobed leathery capsule..... (3)

(1) Cardiospermum, Balloon Vine.
(2) Sapindus, Soapberry, Wild China Tree.
(3) Ungnadia, Spanish Buckeye.

77. Buckthorn Family. Frangulaceae.

Climbing shrub with smooth supple stems..... (1)
Not climbing.
  Spiny shrubs with berry-like black drupes; drupes with 1 stone.
    Petals wanting ..... (2)
    Petals present ..... (3)
  Without spines; fruit dry; petals present.
    Rigid; much branched; sepals spreading..... (4)
    Slender shrubs; sepals converging..... (5)
  Without spines; fruit pulpy, with 3 or 4 stones; a tall shrub or small tree ..... (6)

(1) Berchemia, Rattan.
(2) Condalia.
(3) Ziziphus, Jujube.
(4) Colubrina.
(5) Ceanothus.
(6) Rhamnus, Buckthorn, Indian Cherry.

78. Grape Family. Vitaceae.

Tendrils with adhesive disks; leaves palmately 5-7-foliate.... (1)
Tendrils without adhesive disks.
Bark shreddy; fruit edible ..... (2)
Bark not shreddy.
Leaves thick, succulent, 1-3-foliate, with a disagreeable odor ..... (3)
Leaves thin, 2-pinnately compound..... (4)

(1) Parthenocissus, Virginia Creeper, Woodbine.
(2) Vitis, Grape.
(3) Cissus.
(4) Ampelopsis.

79. Mallow Family. Malvaceae.

Carpels as many as the stigmas.
Flowers yellow.
Carpels 2-several-seeded (sometimes 1-seeded in Wissadula); stems erect; leaves velvety.
Carpls 1-celled..... (1)
Carpels 2-celled by a transverse partition, the partition sometimes incomplete; flowers orange-yellow; petals ½ to ¾ inch long..... (2)
Carpels 1-seeded (See Wissadula).
Calyx subtended by 3 bractlets..... (3)
Calyx without bractlets; stems slender, wiry..... (4)
Flowers red, purple, pink, or white.
Flowers large, 1½ to 2 inches in diameter, deep red-purple, or sometimes white; petals irregularly notched toothed or fringed at the apex..... (5)
Flowers small, pink or purplish; calyx subtended by 2 or 3 bractlets.
Carpels 2-celled; 1 seed in each cell..... (6)
Carpels 1-celled; 2-several seeded..... (7)
Carpels ½ as many as the stigmas.
Flowers scarlet or crimson; fruit red, berry-like when nearly mature. The carpels separate at maturity..... (8)
Flowers pink; fruit dry ..... (9)

(1) Abutilon, Indian Mallow.
(2) Wissadula.
(3) Malvastrum.
(4) Sida.
(5) Callirrhoe, Poppy Mallow, Wine Cup.

(6) Modiola.
(7) Malva, Mallow, Cheeses.
(8) Malvaviscus.
(9) Pavonia.

80. Tamarix Family. Tamaricaceae.

Trees with slender branches, very small, scale-like leaves, and large clusters of small pink flowers..... (1)

(1) Tamarix, Tamarisk, Salt Cedar.

81. St. John's-wort Family. Hypericaceae.

Low shrubs, with small leaves and yellow flowers; stamens many; sepals and petals 4..... (1)

(1) Ascyrum, St. Peter's-wort, St. Andrew's Cross.

82. Rock-rose Family. Cistaceae.

Flowers of 2 kinds, small ones without petals, and larger with petals ..... (1)
Flowers not of 2 kinds; much-branched plants with very slender stems and minute red-purple flowers..... (2)

(1) Helianthemum, Rock-rose.
(2) Lechea, Pin-weed.

83. Violet Family. Violaceae.

Flowers large, blue ..... (1)
Flowers small and inconspicuous, white or nearly so..... (2)

(1) Viola, Violet.
(2) Calceolaria.

84. Cactus Family. Opuntiaceae.

Stems nearly globuler or short cylindric.
Stems globular, large; mostly under ground, only the stem apex rising above the surface; spines very stout, curved, pink ..... (1)
Stems nearly globular, with 13 prominent ribs; spines slender, about 1 inch long ..... (2)
Stems short cylindric, usually clustered; spines very short, spreading, the cluster scale-like in appearance..... (3)
Stems nearly globular, covered with cylindric tubercles.... (4)

Stems long-cylindric, jointed, woody..... (5)
Stems succulent, jointed, joints broad and flat..... (6)

(1) Echinocactus, Devil's Pin Cushion.
(2) Echinocactus (another species).
(3) Echinocereus.
(4) Cactus, Nipple Cactus.
(5) Opuntia. A large species of this type is the Tree Opuntia, or Tasajillo.
(6) Opuntia (other species), Prickly Pear.

84a. Laurel Family. Lauraceae.

Aromatic shrubs; leaves simple, deciduous; flowers yellow, dioecious ..... (1)

(1) Beuzoin, spice-bush.

85. Loosestrife Family. Lythraceae.

Calyx tube not elongated, becoming globular in fruit; leathery plants, with small pink flowers in the axils of the leaves; leaves narrow ..... (1)
Calyx tube nearly ¼ inch long; slender plants, with pink or purple flowers; sepals alternating with spreading appendages ..... (2)

(1) Ammannia.
(2) Lythrum, Loosestrife.

86. Evening-primrose Family. Epilobiaceae.

Flowers pink or white.
  Fruit dehiscent, flowers large, regular; petals 1-2 inches long ..... (1)
  Fruit indehiscent, flowers smaller, irregular..... (2)
Flowers yellow, or petals sometimes wanting in Isnarda.
  Calyx tube not prolonged beyond the ovary.
    Stamens 4; petals very small or wanting..... (3)
    Stamens 8-12; petals conspicuous..... (4)
  Calyx tube prolonged beyond the ovary.
    Plants apparently stemless ..... (5)
    Plants with evident stems.
      Stigma disk-like ..... (6)
      Stigmas 4, elongated.
        Capsule with 4 broad wings; petals 2 inches long or more ..... (7)

Capsule not winged; flowers smaller.
Ovules horizontal in the ovary..... (8)
Ovules not horizontal ..... (9)

(1) Hartmannia, Pink Primrose.
(2) Gaura, Wild Honeysuckle.
(3) Isnarda, Marsh Purslane.
(4) Jussiaea.
(5) Lavauxia, Yellow Primrose.
(6) Meriolix, Yellow Primrose.
(7) Megapterium, Yellow Primrose.
(8) Onagra, Evening Primrose.
(9) Oenothera, Evening Primrose.

87. Water-milfoil Family. Gunneraceae.

Water plants, submerged except the flowering tips of the branches; submerged leaves many and divided into hair-like segments ..... (1)

(1) Myriophyllum, Water-milfoil.

88. Dogwood Family. Nyssaceae.

Tall shrubs with opposite leaves and black drupes; leaves white-woolly below..... (1)
Shrubs with opposite leaves and white drupes; leaves harsh, with short stiff hairs ..... (2)

(1) Garrya.
(2) Suida, Dogwood.

89. Carrot Family. Ammiaceae.

Note: The genera in this family are difficult to identify, because it is usually necessary to examine thin cross sections of mature fruits under the microscope to determine the presence or absence of oil tubes.

Fruit without evident oil tubes; fruit more or less laterally flattened.

Note: Lateral flattening tends to narrow the cross wall between the carpels.

Fruit prominently ribbed; stems creeping; leaves alternate, round; plants smooth ..... (1)
Fruit not ribbed; leaves opposite; plants hairy..... (2)
Fruit with evident oil tubes.

Flowers in dense globular or ovoid spiny heads; thistle-like (3)
Flowers in more or less evident umbels; not thistle-like.
Fruit strongly flattened dorsally.
Note: Dorsal flattening tends to widen the cross partition between the carpels.
Lateral ribs winged; wings armed with bristles..... (4)
Lateral ribs winged; wings without bristles..... (5)
Fruit only sligtly flattened dorsally or laterally.
Ribs of the fruit winged ..... (6)
Ribs with tubercles or spines..... (7)
Fruit with hooked bristles..... (8)
Fruit distinctly flattened laterally.
Stylopodium conic.
Perenial water plants; ribs inconspicuous; oil tubes more than 1 in the intervals between the ribs.... (9)
Land plants; 1 oil tube in each interval.
Outer fruits of the cluster with barbed spines, inner with tubercles; fruit ovoid, about ⅛ inch long....(10
Fruit ribbed and tubercled, about 1/16 inch long or less .....(11)
Fruit elongated, about ¼ inch long, ribbed.....(12)
Stylopodium flat or wanting; fruit prominently ribbed.
Corrolla regular .....(13)
Corrolla irregular, petals very unequal.....(14)

(1) Hydrocotyle, Marsh Pennywort.
(2) Bowlesia.
(3) Eryngium, Button Snakeroot.
(4) Daucus, Wild Carrot. Often called Queen Anne's Lace when in blossom, and Stick-tight when in fruit.
(5) Lomatium.
(6) Thaspium.
(7) Ammoselinum, Sand Parsley.
(8) Sanicula, Snakeroot.
(9) Berula, Cut-leaved Water-parsnip.
(10) Torilis, Hedge Parsley.
(11) Spermolepis.
(12) Chaerophyllum, Chervil.
(13) Apium, Marsh Parsley.
(14) Ammi.

90. Heath Family. Ericaceae.

Small trees, with thin dark red bark, peeling off in large sheets; branches smooth, flesh colored ..... (1)

(1) Arbutus, Medroña.

91. Primrose Family. Primulaceae.

Plants small; flowers blue. . . . . (1)
Plants large; flowers nodding, pink with a darker center; sepals and petals reflexed. . . . . (2)
Flowers small, white, in spreading clusters. . . . . (3)

(1) Anagallis.
(2) Dodacatheon, Shooting-star.
(3) Samolus.

92. Ebony Family. Ebenaceae.

Shrubs with yellow flowers and black berries; leaves thick, woolly below; bark smooth, gray. . . . . (1)

(1) Brayodendron, Mexican Persimmon.

93. Sapodilla Family. Sapotaceae.

Shrubs or trees, resembling the live oak, but with leaves woolly underneath, and the branches bearing thorns. . . . . (1)

(1) Bumelia, Gum Elastic.

94. Storax Family. Styracaceae.

Trees with glossy, angled leaves and bell-shaped, white flowers (1)

(1) Styrax, Storax.

95. Olive Family. Oleaceae.

Shrubs, with simple opposite leaves; blooming very early in the spring; flowers small, inconspicuous . . . . . (1)
Trees, with pinnately compound leaves and winged fruits. . . . (2)
Herbs, with yellow flowers; leaves 3-7-cleft or parted. . . . . (3)

(1) Adelia.
(2) Fraxinus, Ash.
(3) Menodora.

96. Logania Family. Spigeliaceae.

Lobes of the corolla imbricated in the bud.
Shrubby perennials; calyx woolly. . . . . (1)
Smooth annuals . . . . . (2)
Lobes of the corolla valvate in the bud.

Styles permanently united, jointed near the middle; corrolla funnel-form ..... (3)
Styles separate when mature; corolla urn-shaped ..... (4)

(1) Buddleia,
(2) Polypremum.
(3) Coleostylis.
(4) Cynoctonum.

97. Gentian Family. Gentianaceae.

Flowers numerous, pink; plants usually stiff..... (1)
Flowers pink, with a very conspicuous yellow or greenish center, larger and less numerous than the preceding; plants not stiff ..... (2)
Flowers about 2 inches long, blue or lavender..... (3)

(1) Erythraea, Centaury, Mountain Pink.
(2) Sabattia, locally called Texas Star.
(3) Eustoma, Blue Gentian.

98. Dogbane Family. Apocynaceae.

Flowers blue; leaves long and narrow..... (1)

(1) Amsonia.

99. Milkweed Family. Asclepiadaceae.

Twining vines or prostrate plants.
Crown of 5 erect lobes, each with 2 awns; climbing vines; fruit 4-6 inches long ..... (1)
Crown lobes without awns; climbing vines, with very small white flowers; fruit 2 inches long or less..... (2)
Crown a ring, or saucer-shaped; climbing vines or prostrate herbs ..... (3)
Crown double, the outer a ring, the inner of 5 fleshy hood-like lobes; climbing vines ..... (4)
Stems upright or spreading.
Lobes of the crown concave, each bearing a curved horn which projects from within..... (5)
Lobes of the crown without horns..... (6)

(1) Gonobolus, Climbing Milkweed.
(2) Metastelma.
(3) Vincetoxicum.
(4) Philibertella.
(5) Asclepias, Milkweed.
(6) Asclepiodora, Milkweed.

100. Dichondra Family. Dichondraceae.

Creeping plants with small round leaves..... (1

(1) Dichondra.

101. Morning-glory Family. Convolvulaceae.

Styles distinct, or united only at base.
  Each style 2-cleft; stigmas slender..... (1)
  Styles not cleft; stigmas nearly globular..... (2)
Styles completely united.
  Stigma nearly globular.
    Leaf blades narrow; flowers white..... (2)
    Leaf blades broad; flowers pink or lilac..... (3)
  Stigmas elongated, thread-like or short cylindric..... (4)

(1) Evolvulus.
(2) Breweria.
(3) Ipomea, Morning-glory.
(4) Convolvulus, Bindweed.

102. Dodded Family. Cuscutaceae.

Parasitic vines without green leaves..... (1)

(1) Cuscuta, Dodder.

103. Water-leaf Family. Hydroleaceae.

Ovary 1-celled; styles 2-cleft; leaves lobed or dissected.
  Corolla lobes convolute in the bud; corolla about an inch broad ..... (1)
  Corolla lobes imbricated in the bud; racemes coiled..... (2)
Ovary 2-celled, occasionally 1-celled; styles 2, not united; leaf blades neither lobed nor dissected..... (3)

(1) Nemophila.
(2) Phacelia.
(3) Marilaunidium.

104. Phlox Family. Polemoniaceae.

Leaves alternate, variously toothed, cut, or lobed..... (1)
Leaves opposite, entire ..... (2)

(1) Gilia.
(2) Phlox, Sweet William.

105. Nightshade Family. Solanaceae.

Fruit a berry; expanded portion of the corolla nearly flat, tube short.
Anthers opening by terminal pores..... (1)
Anthers opening lengthwise.
Berry enclosed in the calyx at maturity.
Calyx inflated ..... (2)
Calyx not inflated ..... (3)
Berry not enclosed in the calyx at maturity.
Stamens attached to the base of the corolla tube.... (4)
Stamens attached to the mouth of the corolla tube; vine-like shrubs ..... (5)
Fruit a capsule; corolla funnel-form, or with an elongated tube.
Capsule prickly; large coarse herbs..... (6)
Capsule not prickly.
Flowers clustered, white; filaments about equal in length (7)
Flowers single in the axils of the leaves; filaments unequal.
Flowers purple ..... (8)
Flowers white, or with purple lines..... (9)

(1) Solanum, Night-shade. Includes Horse-nettle, Black Nightshade, Blue Nightshade, etc.
(2) Physalis, Ground Cherry, Jerusalem Cherry.
(3) Chamaesarcha.
(4) Capsicum, Bird Pepper.
(5) Lycium, Matrimony vine.
(6) Datura, Jimson weed.
(7) Nicotiana, Wild Tobacco.
(8) Petunia.
(9) Bouchetia.

106. Borage Family. Borraginaceae.

Coarse perennial herbs with yellow flowers..... (1)
Corolla white, funnel-form, with spreading lobes..... (2)
Corolla white or greenish, with erect lobes; fruit shining white nutlets ..... (3)

(1) Lithospermum, Puccoon.
(2) Myosotis, Forget-me-not.
(3) Onosmodium.

107. Ehretia Family. Ehretiaceae.

Trees with very rough leaves..... (1)

(1) Ehretia.

108. Heliotrope Family. Heliotropiaceae.

A low annual, with white flowers; corolla hairy in the throat.. (1)

(1) Heliotropium, Heliotrope.

109. Verbena Family. Verbenaceae.

Herbs.
  Creeping perennials, with minute flowers in very dense spikes or heads; leaves toothed, not lobed..... (1)
  Erect or spreading; flowers blue or purple..... (2)
Shrubs.
  Flowers white.
    Leaves palmately compound..... (3)
    Leaves simple ..... (4)
  Flowers orange or yellow, in terminal clusters; fruit drupe-like ..... (5)
  Flowers pink, clustered in the axils of the leaves; fruit violet ..... (6)

(1) Phyla.
(2) Verbena.
(3) Vitex.
(4) Aloysia, White-brush.
(5) Lantana.
(6) Callicarpa, French Mulberry.

110. Mint Family. Lamiaceae.

Ovary merely 4-lobed; style attached to the sides of the lobes; corolla very irregular, lower lobe very short; stamens excerted from the corolla ..... (1)
Ovary 4-divided; style attached to the base of the lobes.
  Calyx irregular, 2-lipped, with a broad flat crest; calyx enclosing the fruit, opening by a slit..... (2)
  Calyx not crested.
    Corolla conspicuously irregular, 2-lipped.
      Anther-bearing stamens 4.
        Calyx irregular, 2-lipped; flowers pink..... (3)
        Calyx regular or nearly so, not 2-lipped.
          Calyx tube faintly nerved, inflated in fruit..... (4)
          Calyx tube conspicuously 5-10 ribbed or nerved, not inflated.
            Calyx lobes spine-tipped; flowers in dense clusters, scarlet or orange; clusters 2 inches or more in diameter ..... (5)

Calyx lobes not spine-tipped.
Perennials with woolly foliage; flowers white (6)
Annual or biennial, not woolly.
Flowers white or nearly so; nutlets nearly round in cross section ..... (7)
Flowers purple-red; nutlets 3-sided..... (8)
Anther-bearing stamens 2.
Anthers united, the connective of each much elongated and bearing a perfect pollen sac at one end and a rudimentary one or none at the other.
Throat of the calyx tube not densely hairy.... (9)
Throat of the calyx tube closed at maturity by a circle of dense white hairs..... (10)
Connectives not elongated; flowers in dense, round terminal and axillary clusters.....(11)
Corolla nearly regular.
Anther-bearing stamens usually 2; calyx with an enlargement at the base and its throat closed by hairs; plants lemon-scented .....(12)
Anther-bearing stamens 4; plants strongly aromatic but not lemon-scented .....(13)

(1) Teucrium.
(2) Scutellaria, Skull-cap.
(3) Brazoria.
(4) Physostegia, Dragon Head, Lion's Heart.
(5) Leonotis.
(6) Marrubium, Horehound.
(7) Stachys, Hedge Nettle, Wound-wort.
(8) Lamium, Dead Nettle, Henbit.
(9) Salvia, Sage.
(10) Salviastrum.
(11) Monarda, Horse-mint.
(12) Hedeoma, Mock Pennryroyal.
(13) Mentha, Mint. Includes Spearmint and Peppermint.

111. Figwort Family. Rhinanthaceae.

Upper lip of the corolla overlapping the lower in the bud.
Flowers yellow; perfect stamens 5; flower stalk tall, stiff; flowers in a spike; herbs with a basal rosette of large leaves; leaves densely woolly with branched hairs..... (1)
Flowers yellow; perfect stamens 4 or 3.
Sepals united into an angled tube; stems creeping..... (2)
Sepals nearly distinct; stems usually prostrate but not creeping ..... (3)

Flowers pink, purple, white or blue; fertile stamens 4.
Corolla conspicuously irregular.
Corolla tube with a conspicuous spur at the base; flowers blue ..... (4)
Corolla tube swollen at the base; throat of the corolla closed by two palate-like folds; capsule opening by pores on the sides ..... (5)
Corolla irregular, but not conspicuously so.
Fifth filament present, enlarged and bearded with yellow hairs, sterile ..... (6)
No bearded sterile filament present.
Calyx irregular, one sepal much larger than the others; smooth, succulent, creeping plants; flowers white ..... (7)
Sepals nearly equal; erect plants, much branched; annual ..... (8)
Shrubs; leaves densely white-hairy; flowers pink or purple ..... (9)
Lower lip of the corolla overlapping the upper in the bud.
Sepals nearly distinct, stamens 2; capsule deeply notched..(10)
Sepals united; stamens 4.
Corolla strongly 2-lipped; flowers subtended by large bracts colored like the calyx and corolla.....(11)
Corolla not strongly 2-lipped; flowers not subtended by colored bracts; flowers pink, purple or white.....(12)

(1) Verbascum, Mullein.
(2) Mimulus, Monkey Flower.
(3) Mecardonia.
(4) Linaria, Toad Flax.
(5) Antirrhinum, Snap-dragon.
(6) Penstemon, Beard-tongue.
(7) Monniera.
(8) Conobea.
(9) Leucophyllum.
(10) Veronica, Speedwell.
(11) Castilleja, Painted Cup, Indian Paint Brush.
(12) Gerardia.

112. Acanthus Family. Acanthaceae.

Corolla convolute in the bud; stamens 4.
Calyx lobes bristle-like; ovules 2 in each cavity of the ovary; anther sacs pointed at the base..... (1)
Calyx lobes narrow, but not bristle-like; ovules 3-10 in each cavity; anther sacs not pointed at base..... (2)

Corolla imbricated in the bud; stamens 2.
Flowers in long-stalked spikes from the axils of the leaves; leaves elongated, willow-like ..... (3)
Flowers solitary in the axils of the leaves; leaves oval or ovate ..... (4)
Flowers clustered in spikes with conspicuous bracts; leaves oval or ovate ..... (5)

(1) Calophanes.
(2) Ruellia.
(3) Dianthus, Water Willow.
(4) Siphonoglossa.
(5) Diapedium.

113. Bladderwort Family. Pinguiculariaceae.

A very delicate water plant; stems thread-like; leaves very small, bladder-bearing; flowers yellow, irregular..... (1)

(1) Utricularia, Bladderwort.

114. Trumpet-creeper Family. Bignoniaceae.

A vine with pinnately compound leaves and large, trumpet-shaped orange-red flowers. Capsules elongated; seeds numerous, winged ..... (1)

(1) Campsis, Trumpet-creeper.

115. Martynia Family. Martyniaceae.

Strong-scented, viscid-hairy plants, with large, tubular flowers. Pod with a curved beak several inches long..... (1)

(1) Martynia, Unicorn Plant, Devil's Claws.

116. Plantain Family. Plantaginaceae.

Low annual or perennial herbs; apparently stemless; flowers in dense spikes on elongated stalks..... (1)

(1) Plantago, Plantain.

117. Mistletoe Family. Loranthaceae.

Green-leaved parasites on the branches of trees; berries white, sticky ..... (1)

(1) Phoradendron, Mistletoe.

118. Madder Family. Rubiaceae.

Shrubs with flowers in dense spherical heads; leaves opposite, occasionally in wholes of three..... (1)
Herbs.
One ovule in each cell of the ovary.
Leaves in whorls; stems weak, 4-angled, often with stiff bristles on the angles..... (2)
Leaves opposite; flowers in clusters subtended by a 4-bracted involucre ..... (3)
Several ovules in each cell of the ovary; flowers solitary or clustered, not in an involucre ..... (4)

(1) Cephalanthus, Button-bush.
(2) Galium, Bed-straw.
(3) Crusea.
(4) Houstonia, Bluets.

119. Honeysuckle Family. Caprifoliaceae.

Shrubby vines.
Flowers clustered at or near the ends of the branches; some of the pairs of leaves near the ends of the branches united around the stem ..... (1)
Flowers in pairs; very fragrant; leaves not united around the stem ..... (2)
Shrubs or small trees.
Leaf blades pinnately compound; flowers white, in large flat-topped clusters; fruit dark red; shrubs..... (3)
Leaf blades simple.
Tall shrubs or small trees; bark not shreddy; ovary 1-3-celled ..... (4)
Slender shrubs; bark shreddy; ovary 4-celled..... (5)

(1) Lonicera, Honeysuckle.
(2) Nintooa, Honeysuckle.
(3) Sambucus, Elderberry.
(4) Viburnum, Black Haw.
(5) Symphoricarpos.

120. Valerian Family. Valerianaceae.

Fleshy annuals; flowers white, in terminal, 4-sided clusters.. (1)

(1) Valerianella, Corn Salad, Lamb lettuce.

121. Birthwort Family. Asaraceae.

Low herbs, with an irregular long-tubular, corolla-like calyx.. (1)

(1) Aristolochia.

122. Gourd Family. Cucurbitaceae.

Ovules numerous.
  Coarse trailing or creeping vines; leaves simple, a few inches to a foot or more long; odor very disagreeable..... (1)
  Slender vines; leaves deeply 3-5-lobed..... (2)
Ovule 1; fruit bristle-armed; climbing vines..... (3)

(1) Cucurbita, Wild Gourd.
(2) Ibervillea, Balsam, Wild Pomegranate.
(3) Sicyos, Star Cucumber.

123. Bellflower Family. Campanulaceae.

Flowers blue, regular; capsule opening by uplifting valves.... (1)
(1) Specularia, Venus' Looking-glass.

124. Lobelia Family. Lobeliaceae.

Flowers red, very irregular..... (1)

(1) Lobelia, Cardinal Flower.

125. Ragweed Family. Ambrosiaceae.

Staminate and pistillate flowers in different heads.
  Involucre of the pistillate heads bur-like, beaked and prickly; pistillate heads 2-flowered; leaves simple, not deeply lobed or divided ..... (1)
  Involucre of the pistillate flowers with tubercles or prickles, not bur-like; pistillate head 1-flowered; leaves deeply lobed or divided ..... (2)
  Involucre of the pistillate flowers 9-12-winged; pistillate heads 1-flowered ..... (3)
Staminate and pistillate flowers in the same head; involucre not bur-like; leaves not deeply lobed or divided..... (4)

(1) Xanthium, Cocklebur.
(2) Ambrosia, Ragweed.
(3) Hymenoclea.
(4) Iva, Marsh Elder.

126. Thistle Family. Carduaceae.

KEY TO THE TRIBES.

Flowers all alike and regular, the outer sometimes larger, but none with strap-shaped corollas.
Anthers with elongated appendages at the apex; involucre of very many overlapping bracts; receptacle bristly; pappus of numerous bristles IX
Anthers without elongated appendages at the apex, but with two tails at the base; receptacle chaffy or naked; pappus of bristles or wanting..... IV
Anthers neither tailed at the base, nor with elongated appendages at the apex.
Pappus a short crown or wanting; bracts dry and papery, overlapping; receptacle hairy; plants strong-scented.... ..... Artemisia in VII
Pappus of bristles; receptacle naked.
Bracts of the involucre few, overlapping very little if at all; involucre double, with an inner circle of elongated, equal bracts, and another outer circle of very short ones; flowers white or yellowish..Mesadenia in VIII
Bracts numerous, overlapping.
Stigmas thread-like, without terminal appendages; flowers deep purple-red I
Stigmas club-shaped or thickened upward, without terminal appendages; flowers pink, white, or blue.. II
Willow-like dioecious shrubs; stigmas of the staminate flowers with broad terminal appendages.... ..... Baccharis in III
Pappus of scales.
Receptacle with bristles or bristle-like chaff; pappus scales awned; flowers reddish or yellowish..... .....A species of Gaillardia in VI
Receptacle with chaffy scales; pappus scales pointed; flowers white .....Marshallia in V
Receptacle naked.....Polypteris and Hymenopappus in VI
Heads with rays, the flowers of the outer circle with strap-shaped corollas.
Central flowers with 2-lipped corollas..... X
Central flowers regular, not 2-lipped.
Receptacle naked.
Pappus of bristles.
Involucre of few bracts, overlapping very little if at all; involucre double, the inner circle of bracts elongated and equal, the outer bracts few and small .....Senecio in VIII

Bracts of the involucre overlapping, unequal; stigmas flattened, with conspicuous triangular or lance-shaped appendages III
Pappus of scales, awns, a crown or wanting.
Stigma branches flattened, with triangular or lance-shaped terminal appendages III
Stigma branches without conspicuous appendages.... VI
Receptacle chaffy. (Chaff bristle-like in Gaillardia and Eclipta.)
Bracts of the involucre dry and papery; pappus a short crown or lacking; plants strong-scented; leaf blades 2 or 3 times pinnately divided or dissected..... VII
Bracts not dry or papery, herbaceous.
Receptacle covered with bristle-like chaff.
Corolla lobes densely hairy; rays red and yellow.. .....Gaillardia in VI
Corolla lobes not hairy; rays white.....Eclipta in V
Receptacle with chaffy scales..... V

KEY TO THE GENERA.

Tribe I. Vernonieae.

Coarse shrubby perennial herbs; achenes 8-10-ribbed; flowers deep red-purple ..... (1)

(1) Vernonia, Iron Weed.

Tribe II. Eupatorieae.

Achenes 3-5-angled, not ribbed.
Flowers white; receptacle flat..... (1)
Flowers blue; receptacle conic ..... (2)
Achenes 8-10-ribbed.
Flowers pink or purple; heads in stiff spikes; leaves linear, dotted with minute pits ..... (3)
Heads not in spikes; leaves not linear or pitted..... (4)

(1) Eupatrium, Thoroughwort.
(2) Conoclinum, Blue Boneset, Mist Flower.
(3) Laciniaria, Blazing Star, Button Snake-root.
(4) Coleosanthus.

Tribe III. Asterieae.

Rays present.
  Pappus of numerous hair-like bristles, few in some species of Solidago.
    Rays yellow.
      Ray flowers without hair-like pappus..... (1)
      Ray flowers with copious hair-like pappus.
        Heads showy, many-flowered; achenes flattened.... (2)
        Heads small, few-flowered, achenes not flattened, sometimes angled ..... (3)
    Rays not yellow.
      Bracts of the involucre in 3-many series..... (4)
      Bracts of the involucre in 1 or 2 series.
        Rays flowers very numerous, white or pink; corollas longer than the diameter of the disk..... (5)
        Ray flowers few, their corollas short, heads small... (6)
  Pappus of bristle-tipped scales; rays yellow..... (7)
  Pappus of few scales, or awns, or wanting.
    Flowers yellow.
      Both ray and disk flowers fruit-producing; plants more or less resinous or gummy.
        Heads small; leaves narrow, not toothed.
          Pappus wanting ..... (8)
          Pappus in the disk flowers of ovate or awl-shaped scales ..... (9)
        Heads large; leaves broad, toothed; pappus a few deciduous awns or bristles.....(10)
      Disk flowers not fruit-producing; pappus of awn-like scales. Similar to Gutierrezia .....(11)
    Rays not yellow.
      Pappus a lobed, toothed, or ciliate crown; achenes many-ribbed .....(12)
      Pappus a crown-like border, or wanting; achenes flattened, 2-3-nerved .....(13)
      Pappus of 5 or more scales alternating with 5 bristles; achene 5-ribbed .....(14)
Rays wanting; willow-like, dioecious shrubs.....(15)

(1) Heterotheca.
(2) Chrysopsis, Golden Aster.
(3) Solidago, Goldenrod.
(4) Aster.
(5) Erigeron, Daisy Fleabone.
(6) Leptilon, Horse-weed.
(7) Xanthisma.
(8) Gymnosperma.

(9) Gutierrezia, Broomweed.
(10) Grindelia, Gum-plant.
(11) Amphiachyris.
(12) Aphanostephus.
(13) Keerlia.
(14) Chaetopappa.
(15) Baccharis.

Tribe IV. Inuleae.

Heads and leaves white-woolly.
  Receptacle chaffy; upright plants with forking stems..... (1)
  Receptacle not chaffy ..... (2)
Not woolly; heads pink ..... (3)

(1) Filago, Indian Tobacco.
(2) Gnaphalium, Cudweed, Everlasting.
(3) Pluchea, Marsh Fleabane.

Tribe V. Heliantheae.

Rays wanting; pappus of scales; flowers white..... (1)
Rays present.
  Disk flowers perfect but not fruit-producing.
    Achenes not flattened or winged; rays white; pappus wanting ..... (2)
    Achenes flattened, winged; heads large; rays conspicuous.
      Pappus either wanting or of two small awns attached to the wings; rays yellow or white; large coarse perennials; leaves harsh, rigid ..... (3)
      Pappus of three teeth, two attached to the wings; rays 4 or 5; yellow; plants annual ..... (4)
      Pappus an irregular crown; rays 8-10, yellow; plants perennial ..... (5)
    Achenes flattened, margined; rays inconspicuous, short, few; heads small; pappus of 2 or 3 scales or awns.... (6)
  Disk flowers fruit-producing.
    Ray flowers persistent on the achenes, yellow; pappus of 1 or 2 awns or teeth, or wanting..... (7)
    Ray flowers falling readily from the achenes.
      Involucre 4-sided, of 4 partly united bracts, with several smaller ones inside ..... (8)
      Involucre not 4-sided; bracts mostly free (more or less united in Coreopsis, Thelesperma, and Eclipta).
        Achenes not conspicuously compressed, sometimes more or less flattened, but not parallel with the involucral bracts.

Achenes not winged.
Receptacle bearing mere chaffy awns or bristles, or scales not concave or clasping the achenes; rays white ..... (9)
Scales of the receptacle concave, or clasping the achenes.
Achene closely enveloped in the scale, the latter appearing as an outer coat; rays yellow (10)
Achene subtended or loosely enveloped by the scale.
Receptacle strongly convex, conic or columnar; disk brown, rays yellow.
Achenes 4-angled .....(11)
Achenes not angled .....(12)
Receptacle flat or slightly convex (conic in Verbesina).
Rays yellow.
Pappus of 2 awns or scales, with 2 or more scales on each side between them.....(13)
Pappus of 2 awns or scales without intermediate scales .....(14)
Pappus wanting .....(15)
Rays white; stems wing-angled..a species of (18)
Achenes winged, flattened laterally, i. e., perpendicular to the involucral bracts.
Receptacle elongated, columnar; rays yellow, red, or parti-colored.....(16)
Receptacle flat or slightly convex, or conic in Verbesina.
Pappus awns with intermediate scales, united or free; perennials .....(17)
Pappus usually without intermediate scales; annuals.
Involucre flat, bracts spreading; rays white (18)
Involucre bell-shaped or hemispheric; bracts erect or appressed; rays yellow.....(19)
Achenes flattened parallel to the involucral bracts.
Involucre double, the inner bracts broad, erect, the outer narrow and spreading; rays yellow or yellow and red.
Inner involucral bracts united only at base; achenes flat, winged .....(20)
Inner involucral bracts united into a cup; achenes only slightly flattened, wingless...(21)
Involucre single; rays yellow.....(22)

(1) Marshallia.

(2) Melampodium, Mountain Daisy.
(3) Silphium, Rosin-weed.
(4) Lindheimera, Texas Star.
(5) Engelmannia.
(6) Parthenium.
(7) Sanvitalia.
(8) Tetragonotheca.
(9) Eclipta.
(10) Sclerocarpus.
(11) Rudbeckia, Black-eyed Susan, Nigger-head.
(12) Dracopis.
(13) Viguiera.
(14) Helianthus, Sunflower.
(15) Encelia.
(16) Ratibida, Coneflower, Mexican Hat.
(17) Zexmenia.
(18) Verbesina.
(19) Ximenesia.
(20) Coreopsis, Tickseed.
(21) Thelesperma.
(22) Calyptrocarpus.

Tribe VI. Helenieae.

Receptacle naked.
  Leaves gland-dotted; pleasant-scented, often with a lemon odor.
    Perennial; stems shrubby; pappus of scales..... (1)
    Annual, lemon-scented; pappus of 4 or 5 scales and sometimes 2 awns ..... (2)
  Leaves not gland-dotted.
    Rayless, flowers white; involucral bracts white or white-tipped ..... (3)
    Rayless; flowers pink ..... (4)
    Rays present, yellow.
      Involucral bracts not spreading or reflexed; leaves narrow; heads solitary, on long slender naked stalks..... (5)
      Involucral bracts spreading or reflexed.
        Upper leaves clasping the stem; not strong-scented; involucre broad; rays ¾-1 inch long..... (6)
        Leaves not clasping; strong-scented; heads nearly globular; rays ¼-½ inch long..... (7)
Receptacle with bristle-like chaff..... (8)

(1) Thymophylla.
(2) Pectis, Limoncillo.
(3) Hymenoppus.

(4) Polypteris.
(5) Tetraneuris.
(6) Amblyolepis.
(7) Helenium, Sneeze-weed.
(8) Gaillardia. The species with ray flowers is Indian Blanket, or Indian Sunburst.

Tribe VII. Anthemideae.

Receptacle chaffy; rays white.
  Achenes not flattened; heads large, rays ⅜-¾ inch long..... (1)
  Achenes flattened slightly; heads small, in flat-topped clusters; rays short ..... (2)
Receptacle naked or hairy, not chaffy; heads small..... (3)

(1) Anthemis, Mayweed, Dog's Camomile, Dog fennel.
(2) Achillea, Yarrow.
(3) Artemisia, Wormwood, Sagebrush.

Tribe VIII. Senecioneae.

Flowers white or whitish; rays wanting..... (1)
Flowers yellow, rays present..... (2)

(1) Mesadenia, Indian Plantain.
(2) Senecio, Squaw-weed.

Tribe IX. Cynareae.

Leaves spine-tipped, cobwebby; flowers purple; bracts of the involucre tipped with a single spine ..... (1)
Leaves not strongly spine-tipped; heads large, white, pale pink or purplish; bracts of the involucre fringed all around with bristles ..... (2)

(1) Carduus, Thistle.
(2) Centaurea, Star Thistle.

Tribe X. Mutisieae.

Leaves in a basal rosette, white-hairy below; head solitary, on a slender stalk, nodding, white or pink..... (1)

(1) Thyrsanthema.

127. Chicory Family. Cichoreaceae.

Pappus wanting ..... (1)
Pappus of scales or scales and bristles..... (2)
Pappus of bristles only.
  Flowers yellow.
    Achenes roughened with tubercles or spines at the top, beaked ..... (3)
    Achenes not tubercled or spiny.
      Achenes narrowed or beaked at the top.
        Achenes cylindric or prismatic, usually ribbed..... (4)
        Achenes flattened; heads small..... (5)
      Achenes not narrowed..... (6)
  Flowers blue, pink, or white.
    Achenes ¼ inch long or less, narrowed at the base; receptacle chaffy; flowers white or pink..... (7)
    Achenes ½ inch long or more, not narrowed at either end; flowers blue, pink, or purple; leaves few; stems rigid, rush-like ..... (8)

(1) Serinea.
(2) Adopogon, Dwarf Dandelion.
(3) Taraxacum, Dandelion.
(4) Sitilias, False Dandelion.
(5) Lactuca, Prickly Lettuce.
(6) Sonchus, Sow Thistle.
(7) Pinaropappus.
(8) Lygodesmia.